GFIC 2019

Proceedings of the 2nd Global Forum of Intellectual Capital

20th May 2019

GFIC Global Forum of Intellectual Capital
by ICAA

Review Process

Papers submitted to this conference have been double-blind peer reviewed before final acceptance to the conference. Initially, abstracts were reviewed for relevance and accessibility and successful authors were invited to submit full papers. Many thanks to the reviewers who helped ensure the quality of all the submissions.

Conference Proceedings

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Conference Chairs

FLORINDA MATOS

Founder and the president of Intellectual Capital Association (ICAA) and is leading the ICLab – Intellectual Capital Research Center. She holds a PhD in Social Sciences, Organizational Behavior Studies from the Technical University of Lisbon (Portugal). She is a guest professor in Post-Graduate courses at the ISCTE – Instituto Universitário de Lisboa and in several other higher education institutions. She was a researcher at FCT - UNL in the area of social impacts of additive manufacturing and, currently, she is a researcher at DINÂMIA'CET – IUL, Centre for Socioeconomic and Territorial Studies and of the Research Centre for History and Science, Prof. Joaquim Veríssimo Serrão. Her main research interests are: Intellectual Capital, Knowledge Management, Sustainability, Measuring of Intangibles and Innovation. She has published more than 30 academic articles and book chapters. She has also been an active participant in the press, where she has published more than 200 articles of opinion on issues of economic and social actuality, and she has developed a scoring framework for auditing the management of intellectual capital.

PEDRO COSTA

Assistant Professor at the Department of Political Economy in ISCTE-IUL (Lisbon University Institute) and Director of DINAMIA'CET, where he coordinates the research line "Cities and territories". Economist, PhD in Urban and Regional Planning, has worked mainly in the areas of cultural economics, territorial development and planning, focusing on his recent research, among other aspects, the role of cultural activities in territorial development, the relations of creative dynamics with territories, or local development promotion strategies. Has collaborated on several projects, particularly in the areas of planning, regional/local development and cultural activities.

Preface

The impacts of digital transformation on society in general and, particularly, on people's lives, are increasing the debate between policy makers, researchers and the industry.

Digital transformation and its accompanying processes of automation, robotics and artificial intelligence are becoming one of the central concerns of the contemporaneous social evolution.

People and nations governance are confronted not only with opportunities suddenly open to individuals and societies, but also with the potential problems that are emerging from them and for which there is not yet a clear formulation, nor ideas of their consequences.

All aspects of people's lives and of society are being covered: employment, education, governance, social life, sustainability, values, economy, democracy, among others.

The objective of GFIC2019 – Global Forum of Intellectual Capital is to explore the challenges of this new revolution, pointing out solutions and showing how knowledge management can enable the transition process, associated to the digital transformation and guided by the principles of sustainability.

In some cases, only the abstracts of the papers are published because they have already been accepted for publication in the book "Knowledge, People and Digital Transformation - Approaches for a Sustainable Future" to be published this year.

I would like to thank all the Authors and Keynote Speakers that accepted the challenge of participating in GFIC2019 and of being part of this new era, where man and machine merge and build a new exciting future.

Happy Future

Florinda Matos

Scientific Committee

The Scientific Committee is composed by researchers from different countries of the world who work in the area of Knowledge Management and Intellectual Capital.

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VANESSA FIGUEIREDO is a PhD student in Sociology at ISCTE-IUL in the field of social dynamics in territory, more specifically the social effects of tourism activities in a Portuguese coastal village. She has a master degree in Human Resources Management and advanced studies degree in Management with specialization in Human Resources and Organizational Behavior. Invited Assistant Professor at Soft Skills Lab (LLCT-IUL) from ISCTE-IUL. Within the scope of work developed at Soft Skills Lab (LLCT-IUL), since 2018, she is a member of Online Learning's Team giving support for the preparation and production of ISCTE-IUL online courses.

BORIS SLAVIN graduated the Moscow Lomonosov University in 1986. He is PhD from 1989. Slavin was led of IT departments of different companies from 1995 to 2010. He is one of the founders of the Union of Russian CIO. Slavin deals with topics such as the Economics of knowledge, ICT and innovation. A special place in his research is occupied by the technologies of collective intelligence, he has some books and articles devoted these topics. He is founder of the first expert Network in Russia (EXPINET.RU), in which participate IT specialists. Currently Boris Slavin is an Academic Advisor of faculty of Applied Mathematics and Information Technology, Professor of the Department of Business Informatics and Director of Digital Economy Development Institute in Financial University under the Government of the Russian Federation. Boris Slavin is the organizer of the annual congresses on modern intellectual technologies SMART RUSSIA.

CARLOS BOTELHO has a Phd in Management / Organization and Development at ISCSTE / Lisbon. He is Invited Associated Professor at ISCSP / Lisbon University. Previously worked for nearly 20 years in HRM at a large multinational company. His professional activity combines teaching Strategic HRM and several HRM disciplines at Lisbon University with participation in organizational consulting projects. In addition, his research focus is in conducting studies with real people in real organizations, on subjects such as HRM and performance, performance management systems, Human and Social capital, and HRM maturity models.

CLÁUDIA POCHO is Graduated in Pedagogy at Federal University of Rio de Janeiro (UFRJ), she took her Master's degree in Education at UFRJ and her Doctor of Science degree in Production Engineering also at this Institution (2011). Working as a Professor at Estacio de Sa University from 2000 to 2015, as a coordinator, she also structured the MBA in Corporate Education and Knowledge Management. She works at Furnas Centrais Elétricas S.A. (Brazil) since 2005, in environmental education, information technology, corporate education and knowledge management areas, especially as a leader. Managing teams and projects, recognized externally, she is responsible for implementing Knowledge Management Programs in companies and projects in the energy sector. As an Investigator on assessment models focused on environmental education projects, programs and public policies, she takes her post doctorate studies at NOVA University of Lisbon.

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CATARINA MAIA is the Head of the Technology Licensing Officer at INESC TEC, managing all the Institute Intellectual Property assets. She is invited professor at Porto Business School, Faculdade de Engenharia da Universidade do Porto, and Faculdade de Ciências da Universidade do Porto for innovation and technology-based entrepreneurship courses. Prior to INESC TEC, Catarina set up and served as the managing director of A2B, a business angel investment fund dedicated to technology ventures. She also served as executive and non-executive member in several start-up boards. Her professional experience ranges from software start-ups, large distribution multinational companies and research in international organizations. Catarina holds a MSc. in Management with focus on technology entrepreneurship, MBA in Management and a MSc in Microbiology. She is a Registered Technology Transfer Professional.

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Her research activities focus on human-centric system design in the context of innovation management.

THOMAS KELLER, since 2003 has been a senior lecturer at the ZHAW School of Management and Law, since 2007 as a professor of information technology. From 2008 till end of 2015 he acted as the head of the Institute he built up by setting up an R&D division and a service division with a focus on business process management and business intelligence. His field of expertise is automation and the application of new technologies in enterpreneurial contexts.

FRANCISCA CASTILLA-POLO is Associate Professor in the Financial Economy and Accounting Department, Faculty of Social and Juridical Sciences of the University of Jaén. She completed her PhD at the University of Jaén studying intangible assets from a strategic and accounting point of view. Nowadays, her research interests are focused on Intellectual Capital, Corporate Social Responsibility, Voluntary Disclosures and Cooperatives. She has published in high impact journal as Accounting, Auditing and Accountability Journal, Journal of Cleaner Production or Journal of Intellectual Capital an and has attended numerous international conferences about these topics.

CONSUELO RUIZ-RODRÍGUEZ holds PhD in Financial Economics and Accounting with international mention in the Department of Financial Economics and Accounting at the University of Jaen. Her research interests are focused in Intellectual Capital, Disclosure of Intangibles, Social Responsibility and Non-financial Information. In fact, she also has extensive research in intellectual capital, highlighting the usefulness of intangible assets as the main research topic of her doctoral thesis. All this research is complemented by attendance at various international congresses and the publication of articles in high impact journals.

INÊS COSTA FAINA has a bachelor's degree in Economics, by University of Coimbra, and a master's degree in human resources management and Organizational Consultancy, by ISCTE-IUL. She has a special interest in digital presence in workplaces, studying and highlighting the importance of employees to a successful use of technologies and robotic in companies.

INÊS SALGUEIRO is currently a researcher at Universidade Nova de Lisboa – Faculdade de Ciências Sociais e Humanas – IFILNOVA. She is also a researcher at the Research Center Professor Joaquim Veríssimo Serrão. Her academic production includes publications in Portugal, Germany and Spain. Her *research interests focus on* Kant, ethics, sustainability, food ethics, knowledge and technology.

ISABEL SALAVISA is Associate Professor with Aggregation of Economics at ISCTE - Instituto Universitário de Lisboa (ISCTE-IUL), in Lisbon. Currently she is Vice-Rector for Research (since 2018). Her research is conducted at DINAMIA'CET-IUL, Centre for Socioeconomic and Territorial Studies, of which she has been Director (2004-2013) and where she is joint coordinator of the Research Group 'Innovation and Labour'. Currently she is responsible for a work package in project SPLACH - Spatial Planning for Change (2017-2019) – funded by Compete 2020, coordinated by CITTA (Univ. Porto) and with the participation of GOVCOPP (Univ. Aveiro) and DINAMIA´CET-IUL.

FÁTIMA FERREIRO have a Degree in Sociology (ISCTE). Master in Economics and Social Policy (ISEG). PhD in Economics (ISCTE). Lecturer in Universidade do Minho (1991). Assistant Professor in the Department of Political Economy of ISCTE-IUL. Teaches in the areas of History of Economic Ideas, Social and Solidarity Economics, and Economics and Territory. Member of the Scientific Comission of the Department of Political Economy. Member of the Permanent Comission of ISCTE-IUL Pedagogical Council. Coordination of the first year of Economics Degreee in ISCTE-IUL.

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NEVENKA MAHER is Associated professor, was a member of European Commission High Level Group, who prepared a document LAB-FAB-APP Future.
Born in 1951, in Portorose, Slovenia, European Union, she graduated, passed master and doctor degree at University of Ljubljana, Economic Faculty. She left her traces in the work of the Statistic Office, the Parliament of Slovenia, the Court of Audit, the Ministry of Labour where she worked as a head of European Social Fund sector). Although she retired (as a dean of Faculty of Business and Management Sciences in Novo mesto), she is still active in consultancy for EU and UNDP and in Marketing, Accountancy and Management.

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PAULO SELIG Is Doctor by the Federal University of Santa Catarina in Production Engineering, working as a teacher in undergraduate and graduate degree in Production Engineering for more than 30 years in the evaluating processes areas, value analysis and cost systems. Has consulting several business organizations and some large multinationals, having been one of the creators of Brazilian Value Analysis Association, and President of the Brazilian Production Engineering Association, coordinated projects funded by the Organization of American States (OAS) and national funders bodies. Is one of the creators and general coordinator of the International Conference on knowledge and Innovation (Ciki). As the most recent work is the scientific coordinator of a Regional Analysis of Science, technology and innovation Framework to the Santa Catarina state.

RUI RIBEIRO holds a DBA - Doctor of Business Administration by IUL-ISCTE with the study "Business Models of Open Source Enterprise Software Vendors"; MBA with double specialization "eBusiness" and "General Management" by Universidade Católica Portuguesa; IT Engineering graduation by IST. Rui is (2015-) General Manager at IPTelecom, (2012-) Information Management Graduation Director at ULHT - Universidade Lusófona de Humanidades e Tecnologias and (2010-) Executive Director of the LISS – Lusófona Information Systems School. Previously, he was (2013-2018) Sales and Customer Relation Director at Infraestruturas de Portugal S.A. , (2009-2013) Information Systems Director at EP - Estradas de Portugal S.A. and (1998-2009) Professional Services Manager at Sybase in Portugal. He is an assistant Professor at University Lusófona in the fields of IS and Enterprise Strategy, Decision Support Systems; Information Systems Strategy; Mobile enterprise systems, Operations and Logistics Management . In Copelabs, Rui is a researcher in Knowledge & Management Information Models.

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AMY LUK has over 10 years of experience in Knowledge and Records Management. Amy joined HSBC Group as the Country Knowledge and Records Manager (HK) from 2013 to 2018. Before joining the HSBC Group, Amy was a freelance consultant in Knowledge Management and Document Management. Amy completed MPhil Research in Knowledge Management (KM) in 2009 and received her MSc in Information System in 2001. Her research interests are Narrative/Storytelling, Knowledge Management, Sense Making, Knowledge Capture and Knowledge Audit.

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JOÃO CUNHA BORGES holds a MSc in Architecture (ISCTE-IUL,2017). He works as a Researcher at DINÂMIA'CET- IUL, in the project SPACH – Spatial Planning for Change. He wrote a dissertation on the work of Aldo Van Eyck and Alison and Peter Smithson, titled "The dissolution of the modern complex". His research seeks to contribute toa multidisciplinary approach to architectural theory, including Urban Planning History and Sustainability, Aesthetics, Anthropology of Space, Film History and Popular Culture, as well as the problems and potentials of visual representation of urban space.

ULRICH SCHIEFER is an Assistant Professor - ISCTE - Instituto Universitário de Lisboa. Published 8 articles in specialized magazines, has 8 chapters of books and 10 books published. It has 19 technical production items. Participated in 24 events abroad and 25 in Portugal. Acting in the area of Economics and Management In his professional activities he interacted with 7 collaborators in co-authorship of scientific works.

VALTER VAIRINHOS is a Retired Portuguese Navy officer where he served as a naval engineer between 1964 and 2009. He got his Naval Engineer Degree from Portuguese Naval School, an Applied Mathematics Degree (Licenciatura), and a Master´s degree in Statistics and Operations Research from Faculdade de Ciencias, Lisbon Classic University and a Doctoral Degree – in Multivariate Data Analysis - from the Statistics Department, Salamanca University. Currently he shares his investigation activity between ICAA-Santarem and the Departamento de Estatística, Salamanca University. His main investigative interests are related with graph data mining and automatic synthesis of results from multivariate data analysis, being the author of a methodology, based in intersection graphs, to generate automatic synthetic descriptions of results from multivariate data analysis and its implementation through a software (BiplotsPMD) where those ideas are put to use.

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Conference Abstracts

Digital transformation and knowledge management in the public sector: a structured literature review[1]

Ana Alvarenga (ISCTE-IUL, Lisboa, Portugal)
Florinda Matos (Dinâmia'CET – ISCTE-IUL, Lisboa, Portugal)

Abstract:

Purpose - The purpose of this paper is to analyze the focus and evolution of the digital government (DG) literature to describe the aspects of digital transformation in the public sector, and how it is related to knowledge management (KM). Thru a search of the subject to understand its definitions, origins and peculiarities the paper's findings can offer an overview of the state of the research contributing for construction of useful research instruments to identify research gaps on DG and KM in public sector.

Design / methodology / approach – The scientific activity was retrieved, studied and evaluated from literature, supporting the need for structured methods to identify new research opportunities. Articles published were selected in databases according to the defined criteria. This paper analyzed 30 articles using a structured literature review methodology. Ten studies were included to analyze their content namely the relationship between knowledge management and digital governance.

Findings - Knowledge management and digital government are areas of research of growing importance. However, the results show few researches found in the literature, and few authors specialized in the field and also several obstacles to the development of a cohesive body of DG literature showing fragmented. The results also show that studies that relate knowledge management to digital transformation are scarce. In addition, academic researchers should rethink their methodological approaches to contribute significantly to the literature and to the development of research that impact practice in conjunction with practitioners.

Originality / value - The article presents a comprehensive literature review of the articles found in the Scopus and Web of Science databases. The paper's results can offer insights into future research needs.

Keywords: Digital government, Digital transformation, Public sector, Knowledge management, Structured literature review

[1] Paper not available. Paper will be published in a Journal.

Influence of digital media on formation of Russian youth religious identity[2]

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Rybakov A.V. (Astrakhan State University, Astrakhan, Russia)
Chernichkin D.A. (Astrakhan State University, Astrakhan, Russia)
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Abstract: In recent times, modern digital media has a direct impact on almost all spheres of human life. Religious identity in post-Soviet Russia is once again becoming an important part of the national identity for many ethnic groups and is reflected in digital media. Russian religious digital media have certain features. The media are limited by Russian content due to the prevalence of Russian-speaking users. Mainly youth audience exploits it due to lack of digital skills in Russian older generation and peculiarities of Orthodox traditions where – unlike in marketing-oriented digital media – the ideas of non-acquisitiveness, redemption and confession predominate. Russian digital media has no regulation and restrictions for the use of digital media by clergymen. However, Russian youth is involved in digital media to a greater degree than the older generation. The main objective of the study is to identify factors of digital media influence on the religious identity in the Russian youth environment. The main methods of the study include sociological survey, focus group and in-depth interviews to analyze the experience of respondents' participation in network religious projects, to scrutinize values of people using these resources, as well as to assess the influence of these values on the religious identity formation. Special attention was paid to distinguishing the respondents' general attitude to virtual forms of religious networking. The conducted study allowed to identify main trends of the Russian digital media influence on the religious identity construction.

Keywords: digital media, religious identity, Russian digital space, Russian youth

[2] Paper will be republished in *Revista Mátria Digital (*http://matriadigital.cm-santarem.pt/)

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Online-learning at ISCTE-IUL: towards a sustainable education paradigm

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Abstract: Online-learning platforms have long been praised for their great benefits, such as the way they contribute to long-distance students being able to overcome geographical barriers to their education, and the way they allow students to self-manage, by autonomously deciding when they enroll and complete courses. This empowers people from all over the world to engage in lifelong-learning that may have an important impact in their daily lives, especially in developing countries. Besides these benefits, there's also an important dimension that is often overlooked: the contribution that the use of online-learning platforms has in providing a sustainable environment by reducing environmentally-damaging effects and the use of scarce resources. In this paper, we present the economical and environmental impact that the use of an online-learning platform has had in a public University in Lisbon, Portugal. We first present the online-learning platform that was developed in-house and follow up by describing the positive impact that this education paradigm has had in the lives of students, in reducing costs at the University, and in contributing to a more sustainable future.

Keywords: Online-learning; Sustainable Education; Higher Education; Sustainability; Lifelong-learning;

Competitiveness and Intellectual Capital of Nations: Reviewing the role of conditions for innovation, sophistication and austerity measures

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João Carlos Correia Leitão (Universidade da Beira Interior, Covilhã, Portugal)
Leonardo Fernando da Cruz Basso (Universidade Presbiteriana Mackenzie, Brasil)

Abstract: The purpose of this paper is to analyze the influence of intellectual capital on the national wealth of European Union countries. To do so, the main models of intellectual capital and metrics for measuring competitiveness are presented. Then, a proposal for a conceptual model is compiled, which seeks to analyze the moderating effect of competitiveness, through the factors of innovation and sophistication, in the relationship between intellectual capital and national wealth. The results show that there is no consensus on the influence of human capital on national wealth. However, there is consensus that structural capital does not influence national wealth. Relational capital was shown to be positive. In the analysis of the moderating effect of competitiveness, the results were positive in the relationship between human capital and national wealth. In the analysis of the moderating effect on the relationship of relational capital to national wealth, the results show evidence of a positive effect. Despite the evidence of a positive moderating effect on the relationship of human and relational capital to national wealth, we cannot assume that there is a moderating effect on the relationship between intellectual capital and national wealth.

Keywords: Intellectual Capital; Structural Capital; Human Capital; Relational Capital; Competitiveness.

The role of human intellectual capital in business transformation[3]

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Abstract: The paper discusses a mathematical model of intellectual capital, based on Stewart's classification of intellectual capital: the human intellectual capital, internal organizational capital, and external organizational capital. In the article, the internal organizational capital is divided into three groups, which relate to technology, business processes, and information, accordingly. It is assumed that these three groups are the channels of business transformation, which enables improving productivity and management efficiency, as well as automating activities. Business transformation leads to a redistribution of staff shares in the organization. It presents a model, which assumes that the reduction in the share of production personnel is affected by the number of employees engaged in the introduction of new technologies; the reduction in the share of service personnel is affected by the number of managers; and the reduction in the share of information support personnel is affected by the number of ICT specialists. Technologists, managers, and ICT specialists engaged in the business transformation are the human intellectual capital of the company. The model shows the undulating nature of the change in the staff shares in the field of production, services, information and business transformation.

Keywords: intellectual capital, explicit and implicit knowledge, business transformation, human capital

[3] Paper submitted but not presented at GFIC 2019

What matters the most for competitive advantage building in organizations: Human or Social Capital?[4]

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Abstract: The purpose of this paper is to deepen extant knowledge on the mechanisms by which organizations build competitive advantage through employees' capital, namely human capital (HC) and social capital (SC). Scholars have agreed that HRM and HR practices are critical for building employees' capital – human and social, but it is still open to further exploration the mechanisms connecting HR practices with employees' performance through HC and SC. In this quantitative study we explored clusters of HR practices following the AMO framework.

A cross-sectional design was used, encompassing 231 individuals working for private companies of disparate sectors. The research model and hypotheses were tested using structured equation modeling (SEM). Results support the synergistic influence of Human Capital and Social Capital on employees' performance. Furthermore, findings reveal that HC and SC have different connections to the two performance dimensions analyzed – task and supportive behaviors. Finally, HR practices based on one general factor solution was identified as a better antecedent of HC and SC.

In summary, the study advances our understanding of the mechanisms through which people management approaches have incremental effects on employees' human and social capital, and how that impacts on employees' performance, namely by identifying the relation between HR practices and HC and SC.

Keywords: Human Capital, Social Capital, HR Practices, Task Performance, Supportive Behaviors

[4] Paper not available. Paper will be published in a Journal.

Global Forum of Intellectual Capital by ICAA

Emotional intelligence: A Mechanism for Achieving Sustainable Societies

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Carina Abreu (SAPANA, Lisboa, Portugal)
Mark Anthony Kaye (SAPANA, Lisboa, Portugal)

Abstract: Since 2012, SAPANA has been collaborating with organisations from a variety of sectors with the aim of designing practical models for individual sustainability. Through that experience SAPANA has learnt that in order to achieve individual sustainability, the individual must become self-aware; that is, fully conscious of their abilities, emotional barriers, talents and fears. On that basis, SAPANA designed a model for achieving individual sustainability which can then be applied to group sustainability approaches.

SAPANA's model is a fresh perspective on the traditional approaches to sustainability and can be applied not only within the economic and corporate spheres, but also to societies holistically. Developed and honed through SAPANA's social projects, the model proposes creating an additional pillar to the existing concept of sustainability: the individual. For this to be achieved, it is necessary to establish the mechanism of self-awareness within the base layer in the Maslow pyramid. The self-awareness mechanism helps the individual to understand how they can move away from or alienate themselves from achieving need fulfilment, thereby allowing them greater efficacy in moving through the pyramid's layers of need. This approach can subsequently be embedded into the culture and structures of an organization in a profitable manner.

Keywords: emotional-intelligence, sustainability, self-awareness, Maslow, social economy.

Turning Knowledge Management, Human development and Sustainability Concepts into Practice - an ERP Project case study

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Abstract: More than a utopia present in most social imaginaries of groups and populations all over the planet, the "sustainable world" must be a societal option based on knowledge, innovation and sustainable social practices. In this context, the Sustainable Development Goals play a specific role in directing efforts and human participation globally. Beyond the need of critically analyzing these goals through a transformative perspective, it is also necessary to highlight that among the seventeen development goals, it is explicit the importance that a knowledge based society has in order to build and make the "sustainable word" a reality.

This paper aims to discuss how knowledge management processes and practices may enable countries, regions, cities, organizations and human beings to not only assimilate pieces of information but also to produce knowledge in a horizontal, participative and democratic basis towards learning and creating innovative solutions for a social and environmentally fair world. In the case study, a community of practice is presented as a knowledge building tool, where more than one thousand people interacted to solve problems and support the implementation of an IT (Information Technology) project covering ten energy companies in an innovative and participatory way. Results indicate that a CoP may be implemented in order to reduce information and power asymmetry among subjects due to horizontal knowledge dissemination and building processes. These processes favor participation, even when members are geographically dispersed. However, democratic leadership and management practices, as well as the adoption of participatory methodologies must be considered as critical success factors in this case.

Keywords: Sustainability; IT implementation; ERP implementation; Knowledge management; Community of Practice; Social Participation

Patent fees policies and international extension of university patents: Evidence from Portugal

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Abstract: The aim of this article is to shed light on the decision-making process at university technology transfer offices and show that the absence of national patent fees for university-born inventions tend to reduce these patents' international extension. This information has so far been underexploited by policymakers and innovation scholars in drafting public policies that promote innovation. We argue that, for countries that are moderate innovators, and in the context of tight public university budgets and national patent systems with no fees for universities, such absence does not promote the market adoption of inventions. Rather than acting entrepreneurially, the State is fostering the perpetuation of technology- takers market exclusion in those countries, while these inventions are in the public domain in the rest of the world. To support our argument, we review 14 years of patent filing data from the beginning of technology transfer offices in Portuguese higher education institutions, and present a statistical analysis of the relation between patent internationalization, patent fees and financial incentives to internationalization.

Keywords: university patenting, innovation public policies, technology transfer

Smart Cities, Well-being and Good Business: The 2030 Agenda and the role of knowledge in the era of Industry 4.0[5]

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Abstract: Industry 4.0 represents the so-called fourth industrial revolution (4IR). In broad terms, the concept refers to our current stage where the biological, physical and digital boundaries blur. How does the 4IR impact cities? The notion of 'smart city' corresponds to the city perceived through the lens of the 4IR. The previous industrial revolution was mainly characterized by the advent of the digital (1960s-1990s) where the computer and the Internet played a pivotal role. The 4IR is about connectivity and networks (Internet of Things/IoT). In the realm of the specific challenges are: buildings, connectivity, data, energy, governance and transport.

Our claim is that in order for the 4IR to be integrated in cities, three criteria should be met. First, the concept of sustainability should go beyond ecology and economics, it should consider the Agenda 2030 as its framework, in particular the sector of health and well-being. A sustainable city must be a healthy city. Second, urban planning practice is vital to translate information into knowledge. How can we make spatial sense of an increasing amount of information? The practice used to encompass designing physical structures now, however, it needs to incorporate virtual networks, embedded in physical structures. Third, 'smart cities' depend on innovative businesses which respond to the challenges of the 4IR and are an indispensable part of the process.

We conclude that 'smart cities' need above all knowledgeable and innovative governance design strategies, as well as public policies that support and promote well-being, urban planning practice and good business.

Keywords: governance, IoT, health, entrepreneurship, 4IR

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Reading through Pictures
An interpretative study of art and design academics between 1960s and late 1970s in Porto[6]

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Susana Barreto (Professor in Design at the University of Porto, Porto, Portugal)

Abstract: This paper stems from an analysis of the life and work of a group of artists who graduated from the School of Fine Arts in Porto during 1960s and 1970s, surrounding the social and political revolution of 25 April 1974. The study arises from an evidence of insufficient inscription and utilisation of individual knowledge and experience from these particular art and design academics. It puts forward a hypothesis that empirical knowledge derived from this timespan needs to be legitimised as a pedagogic asset in contemporary teaching of art and design.

An acquaintance with the life and work of these artists was made in their studios through ethnographic interviews, and through analysing a selection of visual artefacts from their creations. These have revealed intriguing facets of a generation whose practice was interwoven with handcrafting, social relations and interpersonal connections.

These artists' testimonies provide valuable insight into their personal creative journeys in light of their commitment to education, and how their efforts have helped maintain related formal and tacit streams of traditional knowledge within rapidly changing cultural and socio-political environments. Accordingly, this study aims to establish a basis for a transformation in the way their contributions to knowledge, culture and social fabric are recognised, communicated and activated in future contexts.

The research work has been conducted within the ambit of the project "Wisdom Transfer: towards the scientific inscription of individual legacies in contexts of retirement from art and design higher education and research" (POCI-01-0145-FEDER-029038).

Keywords: Wisdom Transfer, Silver Generation Artists, Intergenerational dynamics, Individual legacy.

[6] Paper will be republished in *Revista Mátria Digital (*http://matriadigital.cm-santarem.pt/). **Best Paper Award at GFIC 2019**

Beyond Digitalization - "My Boss is Artificial"[7]

Elke Brucker-Kley (ZHAW School of Management and Law and Institute of Information Systems, Switzerland)
Thomas Keller (ZHAW School of Management and Law and Institute of Information Systems, Switzerland)

Abstract: Imagine that one day we have reached technological singularity – the point when technological development has outpaced human development. The question of whether machine intelligence is on a par with human intelligence has long been answered. Does this constellation place human fate at the mercy of machines, or is there still room to maneuver?

This paper's objective is to propose a research design to facilitate an interdisciplinary discourse on our digital futures. The research proposal aims to trigger and explore an interdisciplinary discourse on the designability of our digital future based on immersive scenarios. The domain of leadership in an organizational setting serves as an example that shall enable us to frame and discuss "possible futures" in a particular sphere of life.

The main contribution of the immersive scenarios shall be that all experts are able to live through and comment on the same experiences. Based on this common frame of reference, they are able to identify challenges and raise critical questions from the perspective of their disciplines. Compiling, correlating and analyzing those expressed and shared views shall set the stage for design. In order to define the scope for design the extracted requirements and restrictions are to be formulated and provide starting points to frame the evolution of our digital lives proactively and deliberately. Subsequently, the research design - validated and improved based on the quality of the discourse triggered - could be widened in scope (e.g., applied to other domains) or extended to a wider audience to enable further research.

Keywords: Singularity, Virtual Reality, Narrative Scenarios, Artificial Intelligence

[7] Paper not available. Paper will be published in the Book "Knowledge, People and Digital Transformation – Approaches for a Sustainable Future".

Intellectual Capital of Higher Education Institutions and Quality of Life of Internal Stakeholders[8]

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Helena Alves (NECE at University of Beira Interior, Covilhã, Portugal)

Abstract: Higher education institutions (HEIs) that traditionally developed a central activity focused on teaching have been undergoing internal transformations in order to better adapt themselves to external conditions, reinforcing their role and impact on society. In this context, this empirical study aims to identify how the intellectual capital of HEIs shapes the internal stakeholders' quality of life. By using a structural equation model and Partial Least Squares method, it was possible to assess that the intellectual capital of HEIs positively and significantly influences the quality of academic life of students, and the quality of work life of teacher/researchers, especially for students. This study incorporates a new vision on the importance of intellectual capital, shedding light on the still unexplored relationship between intellectual capital and internal stakeholders' quality of life. Several important insights are provided to the HEIs' managers, in order to foster this relationship. In addition, the value creation in HEIs may be fostered through (i) human capital, implying the hiring of more and better-qualified teachers/researchers; (ii) structural capital, improving the management of formal/informal teaching-related processes; and (iii) relational capital, satisfying the needs of students with studies, services, infrastructures, among others.

Keywords: Intellectual Capital; Higher Education Institutions; Performance; Quality of Life.

[8] Paper not available. Paper will be published in a Journal.

How can Social and Environmental Disclosures affect Corporate Reputation in new and Classic Business Models?

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Abstract: Defining the relationship between Social and Environmental Disclosures (SED) and reputation is a task that is yet unachieved and it involves addressing two main issues: the characterization of the relationship sign and the direction of causality. To date, contradictory results have been reached on these lines but it is a key issue in managing new and classic business models.

Our paper theoretically reviews whether SED may or may not lead to a better corporate reputation and under what conditions this relationship would occur. That is, whether only the quantity of SED disclosed is sufficient or if its quality is also necessary to produce reputational improvements. In addition, problems of causality are also raised in our theoretical review. Thus, it can be analyzed if reputation directs disclosure or if disclosure affects reputation. This being stills an open question in the field of the SED that we intend to investigate more deeply.

From a methodological point of view, our revision has included a sample of 53 studies for the 2010-2018 period from the Web of Science (WOS) database, which collects high-prestige indexed publications. All of them were associated to the following blocks: social disclosures and reputation relationship, environmental disclosures and reputation relationship and, finally, SED-reputation relationship causality.

All the above has allowed us to obtain two relevant results: on one hand, the conclusions founds by previous researchers as far SED-reputation relationship is concerned, and on the other hand, the most important gaps detected for future studies on this topic.

Keywords: social and environmental disclosures, corporate reputation, intangible assets, research gaps

Key Competencies for Digital Transformation in Workplace[9]

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Abstract: While automation and artificial intelligence will eliminate very few jobs and occupations during the next decades, they will certainly affect and be present in portions of almost all jobs, either in a greater or lesser degree. Considering this fact, this research intends to identify which competencies are more valuable for workers who work in a technological workplace, by the perspective of the employers. It means this research will explore, listening employers opinion, which competencies are the ones that makes a worker leads and responds positively to a technological implementation in their workplace. Results were gathered through a Delphi study, within a panel of six experts in the human resources for technological industries field. It is finding that employers consider adaptability and creativity as the most important competencies for technological work. Notwithstanding, informatic competencies were less valuable by employers while considering the importance of these competencies for workers dealing with technology or robotic presence in workplaces.

Keywords: Competencies; Delphi; Technology; Technological Work; Digital Transformation

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Knowledge and Technology: Man as a Technological Animal[10]

Inês Salgueiro (IFILNOVA - Universidade Nova de Lisboa, Lisboa, Portugal)

Abstract: Technology is a prominent projection of human reason upon the world. It is an attempt to make the world fit in with what we imagine to be the ideal for us. Human beings, unlike other animals, are capable of understanding their limitations and can not only reflect on these limitations but also envisage what the human condition should be. This paper argues that, given it is not possible for us to reject these ideals of reason, we can infer that to be technical beings is a characteristic of human nature. I shall analyze some issues belonging to our relationship with technology throughout history and show that technology should be viewed as a specific desire prompted by the very nature of human rationality. More than that, technology is an attempt to fill the gap between the limitations of our nature and a continuous increase in our knowledge. This paper is not about the connections between technology and science, morality, politics, economy, society and culture, but about technology as a metaphysical urge of the human condition. I conclude that man is not simply a rational or political animal but a technological animal as well. In our era of global technology, it is possible to see clearly what the reality of our condition has always been.

Keywords: Human reason, knowledge, metaphysics, technology, technological animal

[10] Paper not available. Paper will be published in the Book "Knowledge, People and Digital Transformation – Approaches for a Sustainable Future".

Combining new and old: emergent business models in the food system transition[11]

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Abstract: The research has been developed within a research project on Spatial Planning for Change (SPLACH) through an interdisciplinary approach. The analysis addresses food system's transition in a specific territory, the Lisbon Metropolitan Area (LMA).

The transition of food systems towards a sustainable model has been under analysis and debate. This transition is related with structural changes, namely the emphasis on local production, short supply chains, and the preference for organic products.

The shift of the agri-food system is taking place through the creation of entirely new businesses and the shift of individual farms towards organic production. In both cases, the new enterprises resort to a combination of old agricultural knowledge and techniques, new scientific knowledge regarding productive methods and new technological platforms for advertising and commercialization. These mixed sources permit the creation of interesting forms of new business models, combining old and new knowledge and practices. In addition to the agriculture domain, they exemplify how traditional industries can absorb/generate innovation, at technological and organizational levels, and become in line with the new knowledge-based era.

The study has three main objectives: to identify and analyze the emerging agri-food businesses in LMA; to characterize business models (BM) changes within the transition dynamics towards sustainability; to reflect on the challenges presented by the food system characteristics, in terms of sustainable BM; and to demonstrate that BM specificity – combining new and old knowledge and practices - is closely related to the characteristics of the food system.

The paper presents results of the research on the emergence of a new business models, focusing on the case of an organic food production innovative initiative in the LMA, Quinta do Oeste.

Keywords: food system transition; organic farms; new business models; technological innovation; new marketing forms.

[11] Paper not available. Paper will be published in the Book "Knowledge, People and Digital Transformation – Approaches for a Sustainable Future".

Practical approach to promote the value of Intellectual Capital[12]

Joana Ramos (Cubo Mágico, Portugal)

Extended Abstract: The cognitive ""trade off"" hypothesis by Japanese scientist Tetsuro Matsuzawa with chimpanzees has actually shown us that humans have lost high performance memory in order to trade it for better surviving skills as a community because we needed to communicate rather than memorize complex series of data. Intellectual and human capital are correlated, and that link is a key point to our survival. The working brain defines a computerized task and the accurate instructions rely upon us. So, sharing points of view and interacting will always be our main assets. The step ahead is not only to embrace technology with criteria, but also to engage our thoughts and procedures in order to be in absolute control. Machines will do the hard work for us and we will profit from it... not the other way around. That leaves us time to communicate and establish links between chunks of knowledge. We want to share this knowledge with our associations, our living clusters of thought and we want to have more information on how to effectively do it. So, the main point of my idea, after several years of volunteer work presiding in an association, as well as many political interventions as an elected member of the community and even personal initiatives to promote the value of human capital, as well as my teaching career in multiple environments and entrepreneur in education, is related to the potential of generations to come. I believe it is time to put some effort on the reflection on how to take children into action, since they are very little biased and still have many brain circuits ""unwired"" or "rewireable" only takes the right kind of guidance. I propose a work group to monitor a group of children for a growing period of time, with close link to families establishing a trust relationship. This requires skilled communicators. Not all teachers are, unfortunately. So, we would have to choose the best team based on profile. The team with have to be articulate and open minded, wise and emotionally mature and responsible. Working intellectual capital at this level is a way to prove its importance throughout the working world. And this kind of critical mass does not grow in trees... it runs on nurturing and assertiveness. Adults take themselves too seriously sometimes and forget to pay attention. At some point they decide kids have to be mature, without focus on the process. There is no point in having big data, A.I. and all sorts of innovative platforms of knowledge, if we lose that intangible asset that people like Espinosa pointed centuries before António Damásio and others investigated and formulated about. If we have been trying hard to measure and promote intellectual capital, weren't we supposed to have a first experience to potentiate and be able to measure it during a period of time and actually display results in early ages about the subject? Immerse children in actions, sensations and patterns of thoughts that are interesting to explore, and just watch them grow and actually add value to it! Or continue to sow the same seeds ...and expect the same forest.

Keywords: Education, Science, work, link, diffuse and focused mode, chunks of knowledge

[12] Paper not available.

A Study on Digital Culture Phenomena in Addressing Cyber Threats[13]

Liudmila Baeva (Astrakhan State University, Russian Federation)

Abstract: The article is devoted to the problem of existential risks in the conditions of electronic or digital culture. On the basis of the analysis of existing approaches the characteristic and features of electronic culture as a space of existence of modern person are presented. The studies of digital culture are focused on a rather new research area that are developing nowadays. It is the theory of existential cyber security addressing philosophical and existential analysis, cyber threat research and destructive cyber influence which severely affects values, life purposes, attitude to life and death, etc. The objects of the study are "death groups" ("Blue whale", "Wake me up at 4.20" and others), which have become popular in social networks in recent years, calling on young people to commit suicide, as well as the so-called Columbine community associated with acts of aggression and murder in educational institutions. The article presents the characteristics of the factors associated with teenage suicide with participation in the "death groups" and the main versions explaining the sources of mass terrorist attacks in educational institutions in the Columbine style. External and internal mechanisms that guide the behavior of adolescents and young people, including those related to the influence of the electronic environment, social, economic and other factors, have been analyzed. The problem of virtual youth communities of destructive type is presented from the position of philosophical and anthropological, existential and axiological analysis.

Keywords: digital / e-culture, virtual communities, "death groups", the "Columbine community", suicide, copycat crime, priming.

[13] Paper will be republished in *Revista Mátria Digital (*http://matriadigital.cm-santarem.pt/).

Global Forum of Intellectual Capital by ICAA

Intangible assets and their specific character

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Abstract: We already live in times when investments in intangible assets bring more added value as investments in tangible assets. This fact has turned knowledge based economy (KBE) to economy based on intangibles (IBE). KBE and IBE, they both are knowledge economies. Everybody is aware that economy and social relations have been changing. There are different researches, analysis and explanations done, from focusing on definitions what intangibles are, about intellectual capital or intangibles theory, intellectual capital and intangibles relation to competitiveness and growth on macro level. Answers to the following key issues are important: Why research and innovation (R&I) result are worse than for science? Why innovations do not support development in more efficient way, also competitiveness and enterpreneurship? These questions are rised as GDP is under EU average, in spite of investing nearly 3% for R&D. The answer to these questions is complex and not unique. Although econometrics researches have been bringing many crucial answers, this paper is not based on such a methodology, but it simply reminds on important EU instrument as EFQM model is.

This paper point of view is to turn attention to intangible assets as significant phenomena of Industry 4.0 and tangibles specific character. This model enables to be focused on key gaps as main reasons where traps for future are hidden and it is good to be researched as priority.

Keywords: intangible assets, management, added value, European Framework Quality Management EFQM

Global Forum of Intellectual Capital by ICAA

Measuring the Well-being at work at a Higher Education Institution – A Case Study on ISCTE-IUL

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Florinda Matos (Dinâmia'CET – ISCTE-IUL, Lisboa, Portugal

Abstract: As part of an international agenda focused on innovation and sustainability – economic, environmental, and social – it is increasingly important to understand the impacts that sustainable policies have on people. Public Higher Education Institutions (PSI) are one of the examples of organizations that follow the guidelines of international organizations, such as OECD (Organization for Economic Co-operation and Development), the UN (United Nations) and ESS (European Social Survey), regarding the implementation of sustainability policies. Also, the effect of globalization on people's life's and organizations has been significant. It demands high levels of competitiveness from organizations and those demands are not always compatibles with the needs of local and regional communities and the environment, meaning that the social and environmental interests are put aside the only answer to the economic demands. When this happens, it means that at least one of these principles are not being truly considered. Nevertheless, organizations have become fully aware of their ability to help to solve those issues brought by globalization, they notice that their performance can be positive in people's life's through job creation, well-being improvement, and social and knowledge satisfaction through education. This means that organizations assume the commitment to become more sustainable, using an approach that benefits people and the environment by adding these goals to the main one — profit. Sustainable development has been the keywords of today's organizations. It allows becoming more efficient in an economic point of view but also improves its reputation and people's lives. The aim of this paper is to understand how Well-being is being measured at work in a Higher Education Institution and to be further included in an exploratory study as part of a broader research study to understand the depths of how well-being policies are being held.

Keywords: social responsibility, sustainability, well-being.

Evaluation Framework for Dynamic Capabilities from the Perspective of the Intellectual Capital[14]

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Eduardo Giugliani (Pontifical Catholic University of Rio Grande do Sul (PUCRS), Brazil)

Abstract: Current models of intellectual capital show its evaluative aspect through indicators. However, the literature points out gaps in respect to the response capacity of environment evaluations, and to the evaluation of dynamic capabilities of organizations in networks, locale of this study. Considering this described scene and the research gaps concerning dynamic capabilities related to intellectual capital, this study sought to propose a framework for evaluating the dynamic capabilities from the intellectual capital. The elements that compose the framework were built based on the theoretical approach that considered the dimensions of the intellectual capital: human capital; relational capital; and structural capital; and also based on the perspective that considered the processes of feeling the opportunities of the market, and reconfiguring and integrating resources from the dynamic capabilities. The framework was operationalized by quantitative and exploratory research, non-experimental design, cross-sectional data, deductive method. The methodological proceedings utilised a multiple linear regression as validation of the research analysis model. The application area of the study was represented by ITs' organizations. The results show a possible influence from the human capital and the relational capital over the financial performance, on the context of the organizations that took part on this research. Additionally, the research outcome provides support for the importance of dynamic capabilities related to intellectual capital. The discoveries suggest indicators that contribute, in theoretical terms, with a new research instrument; and in practical terms, with the allocation of investments of the organization to the proper set of resources of intellectual capital in order to obtain competitive advantage.

Keywords: Framework. Dynamic Capabilities. Intellectual Capital. Network Organizations.

[14] Paper submitted but not presented at GFIC 2019

Digital Transformation of the Enterprise Value Chains

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Abstract: In today's world it is a fact that market competition has given an huge advantage for those who are able to better use data. The main reason is that they understand how to develop medium-long term correct strategies, with shortterm pragmatic operational approaches. The challenge is not on how to get or how to produce data, but on how to use it and transform it, in something with business focus and business value. For that reason, it is fundamental to understand deeply on how companies apply the well-known Ackoff DIKW hierarchy (Data, Information, Knowledge and Wisdom) in their value chains. This ability to transform data into wisdom in a real-time mode is pressuring companies to transform themselves, which is known in a simple way as Digital Transformation, but what's happening is that they are transforming their own Value Chain. They are transforming the way they understand the power and how to use Information Systems as a strategic tool and as a strategic value added for decision making, meaning it is no more just a simple technological support activity, like it was originally defined by Michael Porter's Value Chain. This paper, being a conceptual paper, intends to address the importance of the digital transformation that the Value Chains need to face and the need to include Information Systems as a core activity nowadays, to achieve the best data to wisdom transformation. Those who will be able to address this transformation and continuously improvement from data to wisdom, leveraging their Value Chain, will have the ability to optimize their enterprise market value. Those who can address a digital and information systems strategies will be able to get faster optimization of their market value functions.

Keywords: Digital Transformation, Information, Strategy Plan, Value Chain, Information Systems

An Integrated Model of Business-Knowledge-Digital – The BKD Link: Innovating value in a digital journey

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Abstract: In traditional business strategies, an organization would focus on analysing four basic elements: Its strengths, weakness, opportunities and threats (SWOT). This can help the organization to understand its internal capabilities subject to the product differentiation and its positioning in the market. In the emerging trend of Web 3.0, Digerati evolved to drive digital strategy in leading organizational competitiveness and effectiveness. Strategic management of internal capabilities across knowledge, business and digital pillars of an organization is a key success factor of creating values to exploit disruptive innovation or uncontested market opportunities in the digital landscape.

Digital transformation drives the needs of change inside an organization to create a new digital ecosystem, for instance, to change the basic pattern of how an organization can create value, to motivate employees to interact with its stakeholders, and to change its underlying culture, skills, processes, systems and tools needed to perform more efficiently. Efficient knowledge elicitation and innovation from human capital and digital assets can be enabled by emerging cloud computing, cognitive computing and artificial intelligence technologies.

This paper describes an integrated model of business-knowledge-digital (BKD) link, which can institute a knowledge management-driven culture to lead business strategy via digital transformation. The original Knowledge Strategy Framework model was developed by Zack M H (1999). This framework suggested how an organization could bridge the knowledge and strategic gap and prepare itself for aggressive competition in different markets. To thrive in the shifting digital economy that has arisen from the evolution of the internet over the past two decades, the authors of this paper would like to add a new segment of digital strategy, to fulfil the digital potential of an organization by utilizing the intellectual capital, capabilities and resources. Through an integrated modelling of Knowledge Model Canvas (KMC), Business Model Canvas (BMC) and Digital Model Canvas (DMC), this model visualizes how an organization can benefited from establishing knowledge-digital-business link to reinforce value innovation in its business strategies.

Keywords: Knowledge gap, Strategy gap, Intellectual Capital, Digital skills gap, Digital transformation and capabilities

Mapping sustainability transitions in contemporary culture[15]

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Abstract: This presentation draws from research conducted at an ongoing project, 'SPLACH – Spatial Planning for Change', which aims to inform a sustainability transition of the Lisbon Metropolitan Area urban planning, towards an improved food system, responding to contemporary cultural concerns.

But where does contemporary culture really stand with respect to sustainability? Among many contenders for supplanting postmodernism, we would emphasize hypermodernism, digimodernism, metamodernism and transmodernism, since in many respects, these paradigmatic views are engaged with a sustainability transition.

Here, we assess how history, technology and visual culture are valued in contemporaneity. This is done by intersecting our readings of cultural paradigms with key ideas about sustainability, drawn from the SPLACH literature review. Moreover, we highlight opportunities for urban design to accomodate a change towards sustainable urban environments.

Keywords: sustainability transitions, history of ideas, technology, history, cultural paradigms

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Offline digital – digital offline
The potential of offline digitised information for the production, distribution and appropriation of human knowledge[16]

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Abstract: The lifeworlds of large parts of the human population have undergone profound transformations through the expansion of the internet. Yet great parts of the world are still totally or partially offline. Cheap smartphones, tablets and (off-grid) electricity reach ever more of these populations. Scientists' fascination with the internet – where money, investments, business models, communication, political control, as well as their lifeworlds converge - has largely obscured the potential of offline digitised information for the storage and distribution of information and the appropriation of knowledge. The profound changes of the socialisation of human knowledge through the revolutions in the transmission media have influenced how societies produce, distribute, receive and appropriate information. The expansion of access to digitised information revolutionises horizontal and vertical transmission. The differences are manifold: physical requirements are reduced – a whole library fits into a pocket; digital information is much cheaper to acquire; logistic chains through which books or journals are produced, shipped, distributed and stored are as unnecessary as are libraries. The actual access to information is also vastly different – the electronic search function and the offline Wikipedia may serve as examples. This suggests a rethinking of the "digital divide" which is no longer synonymous with internet access. Is there rather a frontier zone where different forms of access overlap? What are the distribution and market mechanisms for offline digital information? To what uses can digitised information be put offline? How will the new availability of ever cheaper technology affect knowledge production and appropriation?

Keywords: Digital Information, Offline Information, Knowledge Production, Knowledge Management, Technology Transfer.

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People, Intangibles and Digital Transformation[17]

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Abstract: This theoretical work seeks to characterize the phenomenon of digital transformation and to relate this concept with the concept of Intangibles and the role of people in the global process in which the basic foundations of life in society and of civilization are much more deeply at stake than they were during the previous technological revolutions.

Throughout the previous technological revolutions, physical attributes of man were replaced by the force of mechanical systems, and later, machines were employed to carry out tasks that are repetitive, painful and dangerous for human beings. In the current technological digital transformation, the most intrinsic and noble characteristics of human being - mental characteristics - are being replaced or can, eventually, be replaced by machines, according to a logic that does not always puts man as the main recipient and beneficiary of those transformations.

So, why is that happening? It has been proven that, in spite of the extraordinary complexity of life in society, of relations between nations and the scientific concepts, the digital transformation makes sense for all those domains and rests on a small number of simple concepts, very stable over time, with universal meaning; this is the case, for example, of the so called Universal Turing Machine. Thus, this explains in great measure the Digital Transformation economic importance and potential for transforming all aspects of social, economic, political and cultural life, especially if that transformation is implemented having mainly in mind economic results.

For the first time in history, it is possible to represent ideas, data, problems, methods to solve them, plans to construct material and immaterial systems, as well as all spoken and written literature and other cultural manifestations using the same principles and technological support. This fact, coupled with free access in real time, by individuals and organizations to this knowledge, produces an increasing acceleration of the creativity and development processes that generates a continuous shrinking time scale. This progressively shrinking time scale begins to exceed the capacity of adaptation of man and of societies, with effects and risks still not completely understood and, much lesser, controlled.

Therefore, this paper also seeks to ascertain, through the analysis of open data, how people are reacting and what are they thinking about these changes.

Keywords: People, Intangibles, Digital Transformation

[17] Paper not available. Paper will be published in the Book "Knowledge, People and Digital Transformation – Approaches for a Sustainable Future".

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Influence of digital media on Formation of Russian youth religious identity

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Introduction

In recent decades, the identity transformation research has become increasingly relevant in Russian and foreign science. Globalization processes simplify identification trajectories neither for individuals nor for social groups. On the contrary, they transform modern identity studies into a mosaic field in which different elements of the mosaic do not simply come together and form a specific pattern, coexisting next to each other, but overlap, being in constant interaction and mutual influence. It is associated with many factors and, above all, with the fact that nowadays the traditional patterns of cultural life are changing under the influence of globalization processes and transition to the Digital era. In the globalization era, the tendency to form some kind of universal leveled identity is counterbalanced by glocalization processes aimed at preserving cultural specificity of the regions. Therefore, it is so difficult, even almost impossible, to create a stable and complete "identity map", and the more important and interesting the process of its comprehension from the modern standpoint is, especially in relation to the younger generation. Diversity and complexity of mutual existence and interaction of identities, their fluidity and ability to transform are noted by many researchers. The fundamental nature of the identity problem is raised in many foreign and Russian studies, including encyclopedic ones (Ronald L. Jackson II & Michael A. Hogg, 2010;

I.S. Semenenko, 2017). One Russian encyclopedia made an attempt to conceptualize and comprehend the problems of the complexity of the category "identity" from a modern point of view. The presence of numerous variable derivatives of identity categories – political identity, ethnic identity, civilization identity, etc. – which do not have clear boundaries between themselves, both in theory and in reality, only emphasizes the complexity of the modern identification process. Another difficulty, which, at the same time, outlines new research horizons, is that identity is not a complete product of social activity but a dynamic structure, the orientation and changes of which depend on many factors. Even at the personal level, it is analyzed not as a fixed constant but as a process. We can talk about repeated adjustment of individual's identity throughout his/her life. Following E. Morin's complexity paradigm (E. Morin, 1977), one cannot ignore the fact that identity construction cannot be considered only as a sum of various personal identities or as a manifestation of sameness of the identities of members of a given community. The complexity of the definition and conceptualization of identity also consists in the fact that it lies in the plane between the individual and the collective, and includes both. However, despite this fact, some researchers insist on a necessity to form a universal identity which, being combined with local cultural specificity, is able to preserve the existing civilization (Sanjoy M. Som, 2019).

Religious identity can be considered as a factor of preservation of civilizational and cultural characteristics. There is a sufficient number of versions of its definition, including vocabulary ones. "Religious identity describes how a person or group understands, experiences, shapes, and is shaped by the psychological, social, political, and devotional facets of religious belonging or affiliation" (Ronald L. Jackson II & Michael A. Hogg., 2010). According to definitions given by Russian researchers, religious identity is a process of person's conscious affiliation to a religious group or religious worldview, self-

identification with this confession and acceptance of the existence of God or supernatural power (A.N. Krylov, 2014; A.P. Zabiyako, A.N. Krasnikov, E.S. Elbakyan, 2006).

Religious identity is also considered from the perspective of its place in cultural processes of different countries (Joanna Różycka-Tran, 2017), (Rezarta Bilalia, Yeshim Iqbala, Ayşe Betül Çelikb, 2018), different population groups (Scott Thumma, 1991), including age groups (Young-Il Kim, W. Bradford Wilcox, 2014), and its impact on different forms of behavior (Daniel J. Benjamin, James J. Choi, Geoffrey Fisher, 2010). Among these studies, a process of religious identity transformation – both in its diachronous and synchronous aspects – holds a special place (Robert P. Jones, Danial Cox, 2017).

In Russian research tradition, the approach to religious identity is mainly integrated (A.N. Krylov, 2014; K.V. Patirbaeva, 2012), since Russia historically developed as a country with multi-confessional traditions. Alongside the dominant Orthodoxy in the Russian Empire, both Islam and Buddhism were regarded as traditional, since the ethnic groups that practised these religions were an integral part of Russian history. Russian researchers (S.A. Lyausheva, A.A. Nagoy, 2009; N.L. Balich, 2015 etc.) are primarily interested in the place of religious identity in modern cultural processes, its formation and change under the influence of global trends. Russian researchers are especially interested in processes of transforming ethno-confessional identities, their interaction with secular identities under the influence of globalization processes and development of a new digital society (I.K. Petrov, A.Kh. Abduvalieva, 2018; E.S. Gorbunova, 2017; M.N. Eresko, 2006). This paper combines two research fields – transformation of religious identity among Russian youth who grew up in the post-Soviet space and the Russian religious virtual space, also created in the post-Soviet period. It determines the goals and objectives of the study.

Goals and objectives

The main goal of the study is to identify factors of digital media influence on religious identity in the Russian youth environment. This goal requires addressing the following tasks:

- to describe the specificity of the Russian virtual space;
- to determine the level of youth involvement in the Russian digital media;
- to assess the degree of attitude towards digital media of both youth and clergy;
- to show the vector of changes in the religious identity of young people under the influence of digital media.

Hypothesis

Culture virtualization among modern youth, belonging to Generation Y, leads to transforming religious identity, which, in its turn, results in departure from conventional channels of communication and transfer of religious experience in the context of religions that are traditional for Russia.

Methodology

To confirm the hypothesis, we conducted a comprehensive sociological study in order to identify the regional specificity of religious identity formation in young people in the modern virtual space. The sample size was 350 students from Astrakhan and Astrakhan region, 25% of which are first-year Bachelor's degree students of Astrakhan State University (ASU), 25% are fourth-year Bachelor's degree students of ASU, 50% are Master's degree students of ASU; 38.1% are males and 60.9% are females. The sampling was focused, quota-controlled by gender, study year and faculty. The primary sociological

information was obtained with the use of the handout questionnaire method. The sampling error was 3%. A biographical interview guide was developed by the authors of the study. Data processing and analysis were carried out using IBM SPSS Statistics 21 statistical package. The data analysis included a linear distribution of respondents' answers to the questionnaire and understanding of parameters of the contingency tables. The analysis of the obtained data allowed to determine the religiosity level and students' involvement in virtual space. A series of questions were asked by all the selected indicators.

Additional primary sociological information was obtained through the biographical (narrative) interview method, which is a qualitative sociological method. The application of this technique allowed to describe subjective experience of specific events and formation of the respondents' religious identity. This method is based on narration by the respondent. In the course of biographical interviews, another source of information was data from family and other archives, as well as additional materials describing the social context. Questions from the biographical interview guide were divided into thematic blocks according to the research tasks.

To achieve the study objectives, a focused selection of respondents was made among clerics from various confessional groups – Orthodoxy, Islam, Judaism and Adventism – who acted as experts. While limiting the search during the focused selection, the "snowball" method was used, consisting in involving prospective new participants that were mentioned by those who had already participated in the interview. Qualitative interviews were processed by transcribing voice interviews with indication of intonation elements, a subsequent meaningful analysis and a "dense" description of the results, as well as the application of the triangulation method.

The focus group interview allowed to determine the level of students' awareness of the presence of virtual religious formations in RuNet, as well as to determine their attitude to such new formations.

Religious identity of Russian modern youth

The youth student community has always been the most progressive and at the same time susceptible to all kinds of ideological influences. It is the most unstable since it is still being formed and is constantly changing. Lability, flexibility, and susceptibility of young people are also explained by social instability of post-Soviet society. (M.A. Golovchin, G.S. Mkoyan, 2018) The post-Soviet youth formation was influenced by traditional human values – family, love and health – which gradually replaced communist ideals. The religious sphere also starts having a significant impact on it. The modern student community is formed by a completely post-Soviet space which, on the one hand, is free of ideological dictates and forcible atheization, but, on the other hand, is actively influenced by digital culture. Representatives of the modern generation of Russian youth are mostly active users of the global network, which, of course, cannot but have an impact on peculiarities of formation of their value picture of the world, form and style of communication, perception, acquisition and understanding of information.

Any modern user of electronic media has an opportunity to be in two worlds. One world is his/her physical existence, where everything is prosaic – daily routine, traditional values and conventional norms. The other world is virtual, where nothing is restricted or forbidden. One can enjoy freedom hiding behind a fake name (nickname), create and join groups of like-minded people, be understood, supported and enjoy electronic favours (likes). That is why the modern younger generation tends to create and promote their digital profile (which always has nothing in common with reality) in social networks, which is quite time-consuming and can lead to voluntary isolation and refusal of face-to-face communication with friends, parents and society in general, i.e. they have less social activities in the real world. It is their susceptibility to little-studied forms of virtual social activity that allows to classify modern young people as representatives of the digital culture, and sets many new tasks for researchers,

one of which is the problem of studying formation of youth identity as such and their religious identity in particular. Since the youth community is the most unstable due to the process of its formation and constant changes, the formation of youth identity is associated with various transgressive processes, which is driven by youth nihilism due to the lack of life and social experience, as well as by the desire to be different from others, even if it is deviant and contrary to social norms and values. This results in young people's striving to go beyond the established norms, to violate them, thereby creating new own boundaries.

It does not mean that religious identity is mainly born by representatives of the older generation of Russians. Most of them were formed as individuals during the Soviet era or in an early period of "Perestroika" (the 1980s), when atheistic worldview prevailed in the Russian society. Religious identity was formed mainly in clergy families, but even young people, originally belonging to a religious environment, in the process of socialization were exposed to atheism in general education schools and universities, which could affect the intensity of their faith. The breaking of ideological barriers and the lifting of bans in the post-Soviet era has made religion a subject of growing interest. The 1990s saw growing interest in non-traditional and mystical cults. New religious organizations began to form in Russia, and foreign preachers surged in here, traveling all over the country. In the 21st century, this process was streamlined and the state began to support, above all, historical and traditional religions: Orthodoxy, Islam and Buddhism. In the period from 1990 to 2009, the proportion of Russians who declared their faith in God, as established by the Russian Public Opinion Research Center (VCIOM), increased almost three times, i.e. from 25 to 73 %. In fact, sociological monitoring recorded a worldview revolution, an "explosion". (D.A. Ovcharov, 2012).

This could not but affected the younger generation. Studies conducted in St. Petersburg in 1995 (530 respondents) and 2000 (460 respondents) showed that at that time, 84 and 89% of the respondents considered themselves believers to some extent, although confessing that they do not follow the religious rituals (N.V. Klinetskaya, 2004). However, even the fact of their self-attributing to believers, even with the answer "rather yes than no" reflects their religious identity. Nevertheless, the post-Perestroika euphoria of "religious freedom" gradually began to wear off, and the younger generation ceased to believe "in violation of" ideological barriers and bans. Our studies in 2015 showed that among students of Southern Russia (Astrakhan Region), only 65.3% considered themselves religious. (M.S. Topchiev, V.S. Dryagalov, O.S. Yakushenkova, 2016). This digital generation is much more rational than the previous ones. We assume that a gradual decrease in religiosity among Russian youth is connected, among other things, with peculiarities of the Russian religious virtual space.

The study results

An integrated approach was used to explore the virtual space of Southern Russia and its impact on youth religious identity. Russian religious web resources were generally described using the content analysis method. Quantitative sociological studies (questionnaire survey) supplemented by qualitative methods (focus groups and expert interviews) were conducted to obtain information about the level of the respondents' awareness of specialized Internet resources and topic-specific applications, as well as the experience of visiting such portals, websites or pages or using these applications both independently and with acquaintances or friends. To identify specific features of the regional religious space of Russia, the authors conducted a series of narrative interviews with clerics of the largest confessional groups: Orthodoxy, Islam, Judaism and Protestantism (the Seventh Day Adventist Church). Each representative of these confessional groups was asked some questions regarding the use of an online platform to facilitate services, communicate with their flock and to inform them about different aspects that are somehow connected with religious practice. While analyzing the interview data, we made an attempt

to compare the specifics of using web resources in each confessional group to identify similarities and differences, as well as the level of involvement in these resources both of the clergy and their flock. Identifying regional features of real and virtual religious spaces, as well as their impact on the youth of Southern Russia, was a specific aspect of the study. Alongside with the series of expert interviews, we conducted a survey among student youth concerning the use of virtual resources of religious content. The description of the study results consists in combination of the data of narrative interviews, questionnaires and focus group studies.

Involvement in the virtual space

If 7-10 years ago a quite high percentage of Russian students did not have a computer and home Internet, now this problem has been solved. 99% of the surveyed students have computers and gadgets and communicate in networks. The surveyed clerics also gave a positive answer to a straight question: "Do you use different gadgets in your life?" Among the most used devices, the respondents mentioned a smart phone, laptop and tablet computer. As for the frequency of using these resources to access the Internet, here certain differences have been found. Almost all the surveyed clerics (with the exception of the Muslim representative) actively use gadgets in their religious activities. The Orthodox representative explains that using gadgets greatly facilitates his religious activities: *"... sometimes I use a voice recorder at meetings, and basically I use the same voice recorder in the phone most of all. There is a desktop computer, but lately I practically have not used it, while mobile applications installed in the phone are of frequent use. I read e-books because financially I cannot afford as many printed books as I have in digital form. And there are books that simply do not exist in print, only in digital form. There are digitized old books, which are impossible to buy, and these are all church books, for example, theological works of the 1880s, and it is very expensive to go somewhere to the library and buy them. Therefore, you have to download such literature to work with or even some fiction to read ..."* (Roman, 36 years old, archpriest, Father Superior of the Sergius of Radonezh church, Astrakhan region).

The representative of Judaism speaks almost identically about the use of gadgets in his activities: "Definitely yes, we often use and implement such resources ... in principle, we see many positive points in this for religious practice ..." (Israel, 36 years old, rabbi of the Jewish community, Astrakhan). The situation is somewhat different with the Islamic expert. He says that in his activity he tries to use gadgets for conducting religious activities as little as possible, but today's pace of social development makes him use these resources more often for conducting activities in virtual space. This contradiction perhaps is related to the age of the informant himself (he's 47 years old). The use of virtual space in his case is also connected with the need to understand young Muslims: "... today a necessity to communicate there is not something new, I even have a page on social media and, as a public and religious figure, I sometimes post different information. But now I understand that I should already counsel people, preach and explain various religious moments through social networks ... I have a page and I am going to post articles even today or tomorrow ..." (Rauf-hazrat, 47 years old, Chief Imam-Akhund of Astrakhan region).

Russian religious virtual space

Because of the nationwide official atheism in the USSR, slightly delayed computerization, high prices and slow growth of Internet networks, the Russian online space starts filling up with content of Internet projects much later than it was in the West and in Europe. In fact, only in the last few years the Russian population has started using gadgets with Internet access relatively massively thanks to the cheapening of technology. Of course, young people occupy leading positions in terms of time and experience in

using such products and services, which is confirmed by the results of our study. 99% of the surveyed students said they used computers and various types of electronic gadgets. Besides, the survey showed that most clerics who took part in the study not only know a lot about modern information technologies but also actively use them in their religious activities. The data obtained suggest that at the moment, a technical basis for further development of the religious digital space has already been formed. Nevertheless, now Russian religious digital media have a number of objective characteristics. First of all, this space is limited by the prevalence of Russian and translated content due to the predominance of Russian-speaking users who are not fluent in foreign languages, which leads to RuNet users' rare visits of non-translated projects in the English-language segment of the Internet. Virtual religious space is mainly used by the youth audience, both due to the lack of high-tech related skills in Russian older citizens and due to the specificity of traditional religions in Russia, where, unlike the marketing-oriented digital media, the prevailing ideas are non-acquisitiveness, expiation, repentance and internal improvement. Russian digital media have no regulations, and the scale of use of digital media for clerics is not defined, which determines the specifics of the Russian religious space functioning.

The Russian virtual religious space is mosaic, primarily due to the historically traditional multi-religiousness. Based on C. Helland's concept (C. Helland, 2002), while describing the results of the study, we use two basic types of religious resources in the Net: religions online and online religions.

Religion online

The religion online space, used primarily as an additional tool of traditional historical religions, is represented in Russia by all three world religions and a number of national ones. Online resources include religious websites, pages, accounts in social media and gadget apps. The most significant in this segment are virtual services of Christianity (Orthodoxy), Islam and Buddhism as traditional historical religions for Russia. In Orthodoxy, for example, these are such all-Russian resources as the Russian Orthodox Church website (www.patriarchia.ru), the Cathedral of Christ the Savior website (new.xxc.ru), the official website of the Sretensky Monastery (www.pravoslavie.ru), and others; in Islam – the official website of the Spiritual Administration of Muslims of the Russian Federation (www.dumrf.ru), the website of the Council of Muftis of Russia (www.muslim.ru), the official website of the Moscow Muftiate (rosmuslim.ru), etc; in Buddhism – the official site of the Buddhist Traditional Sangha of Russia (sangharussia.ru), the website of the Kalmyk Buddhist Center for Spirituality (khurul.ru), the official website of the Ivolginsky Temple (ivolgdatsan.ru), etc.; in Judaism – the website of the Federation of Jewish Communities of Russia (www.feor.ru), the Moscow Choral Synagogue website (centralsynagogue.ru), the website of the Centralized Religious Organization of Orthodox Judaism (keroor.com), etc.

To identify youth experience in using virtual resources with a strongly-pronounced religious focus during the sociological survey, the respondents were asked a question: "Which sources of information provide you with religious news most often?" (Table 1). The most popular sources were "social networks on the Internet" – 22.1% and "television" – 22.0%. The answer "parents, relatives" was chosen by 16.2% of the respondents, while "friends, acquaintances" – by 10.6%.

Question	Response options	Answer in %
Please mark the sources of information that provide you with religious news most often. (Instruction: several options are possible)	Television	22.0
	Newspapers and magazines	7.3
	Radio	2.9
	Social networks on the Internet	22.1
	Specialized sites	4.9

Question	Response options	Answer in %
	Friends and acquaintances	10.6
	Parents and relatives	16.2
	Representatives of religious organizations	8.7
	Other (write below yourself)	1.8
	Not sure	3.5

Table 1. Sources of religious information

In order to identify the most popular social networks among young people, the respondents were asked to assess the degree of popularity of social networks used in Russia. The breakdown of the results, presented in Table 2, is the following:

	Question					Average value
	Please assess the popularity of social networks from your point of view. Assess each network on a five-point scale, where 1 is "not popular", 5 is "highly popular" (circle a corresponding point. Please assess only once in each line).					
Variant of answer	Answer (%)					
	1	2	3	4	5	
1. Vkontakte	7.4	1.4	5.4	12.3	73.4	4.4
2. Facebook	17.1	18.6	30.3	18.0	16.0	3.0
3. Odnoklassniki	30.3	20.6	29.7	10.9	8.6	2.5
4. Instagram	6.3	1.7	5.1	9.1	77.7	4.5
5. Twitter	18.3	10.0	27.7	24.6	19.4	3.2
6. My World@Mail.Ru	59.7	16.6	14.6	3.7	5.4	1.8

Table 2. Social media popularity

As can be seen from the presented data, the most popular social networks among young people are VKontakte (4.4 points) and Instagram (4.5 points). It can be assumed that common resources with a pronounced religious focus are the most widely-spread in these social networks. However, even with such a high popularity of the main social network in Russia (VKontakte), only a small part of the young respondents has experience of communication in groups with a strongly-pronounced religious focus (Table 3). 15.7% of respondents mentioned "VKontakte" as a platform for such purposes, 7.7% chose Instagram. Therefore, virtual religious resources are rather low in popularity among young people of Southern Russia.

№	Question			
11	**Do you have experience of communication in social media groups with a pronounced religious focus?** (Instructions: only one answer is possible in each line)			
Response options	Answer (%)			
	1. Yes	2. No	3. Not sure	4. I don't use this social network
1. Vkontakte	15.7	71.1	10.6	2.6
2. Facebook	2.3	63.1	8.0	26.6
3. Odnoklassniki	2.3	58.3	7.4	32.0
4. Instagram	7.7	74.9	9.4	8.0
5. Twitter	1.7	63.1	7.7	27.4
6.My World@Mail.Ru	1.1	56.9	7.1	34.9

Table 3. Communication experience

Most clerics have an experience of using messengers to contact their flock. The Orthodox priest says that parishioners address hum mostly through instant messengers using voice messages, which, in fact, replaces personal contact with the clergyman: *"...in my case, I communicate with my parishioners mainly in social networks (Vkontakte, Facebook). A lot of people write to me in Whatsapp, Viber or Telegram because they are just more convenient and easier to use. I also noticed that in these applications, voice messages are most often used, SMS are quite rare, telephone conversations are even rarer. As for social networks, here the things are much more complicated: you need to log in, find a person, write to him or her, while Whatsapp is easier and more convenient. I am registered in all social networks, I almost never use Facebook, but VKontakte – a little bit more. I believe that social networks have already been overshadowed, at least among my friends and parishioners. Whatsapp is replacing all of them, Telegram is also popular, so mobile messengers are mostly used ..."* (Roman, 36 years old, archpriest, Father Superior of the Sergius of Radonezh church, Astrakhan region).

At the same time, the Muslim community almost does not use such resources for communication between the cleric and congregation. According to the informant, he mostly uses personal, real-life communication: *"I always prefer face-to-face communication with our parishioners"* (Rauf-hazrat, 47 years old, Chief Imam-Akhund of Astrakhan region). However, despite the rare use of instant messengers for contact with parishioners, the informant uses Islamic mobile applications*: "... they find a lot of applications on the Internet, related to the Quran, pupils sometimes show these applications to me, and after the service the parishioners advise some apps to each other. Today, there are applications with the time of prayer and Qibla, it helps a lot ..."* (Rauf-hazrat, 47 years old, Chief Imam-Akhund of Astrakhan region). Adventists also catch up with using mobile applications and believe that almost every positive Internet product can be adapted for their needs and used in religious activities: *"... First of all, this is the Bible (application), of course, various prayers and interpretations. Everything that is on the Internet can be used in religious life, including special religious applications for children, why not, my children use such applications"* (Aleksandr, 44 years old, pastor of the Seventh Day Adventist Church, Astrakhan). In support of their opinions, the clergy experts named such applications as "Bible", "MyBible", "Church Slavonic Library", "dropprogrammer", "Your version", "Quran", "Namaz Time", "Qibla", "Talmud", "Shabbat", "Prayer Times" and "Torah".

The use of religious mobile applications is one of the factors influencing formation of the virtual religious space both of Southern Russia and of Russia as a whole. In our previous study, which took place in June 2018 (the sample was 300 people), 91.3% of respondents indicated that they had experience of using mobile applications. Every tenth respondent considered him-/herself an active user of mobile applications for religious purposes. The mobile applications that were the most well-known to the respondents, are presented in Table 4 (M.S.Topchiev, D.A.Chernichkin, V.S. Dryagalov, 2018).

	Name	Icon	Known (%)
Which of the proposed religious mobile applications are known to you?	1. Molitvoslov HD (Prayer book)		13.3%
	2. Pravoslavnaya biblioteka (Orthodox library)		12.2%
	3.Muslim Pro		28.9%
	4. 200 questions on the teachings of Islam		11.1%
	5. Buddha Wisdom - Quotes and parables		10.0%

Table 4. Mobile applications for religious purposes

Those respondents whose religious identity can be called Christian in a generalized sense (41% of all the respondents) were asked to specify the services they used when visiting online services of Christian churches. The most popular were lighting a candle (17.1%), visiting a church (through live stream) (16.4%), contact with God (prayer) (16.2%), a donation for the church needs (12.1%) (M.S.Topchiev, D.A.Chernichkin, V.S. Dryagalov, 2018).

According to the representative of Adventists, in addition to regional websites of their churches, there are groups in different social networks. For example, there is a VKontakte group of their local (Astrakhan) church and, as the expert notes himself, this group is the most active. They always post religious news, announce the date and time of the next services, etc. Besides, they upload photos and videos of the previous services. The representative of the Jewish religious organization also spoke of some activities of their Facebook group (Jewish community of Astrakhan, 2019): *"I've chosen one social network, which is used by our young people to communicate, for myself; I ask them to administer my page. We have a person who is responsible for the group on Facebook, he posts there all the information I give him..."* (Israel, 36 years old, rabbi of the Jewish community, Astrakhan). Answering this question, the representative of the Russian Orthodox Church explained that *"... about 7-8 years ago, the top management was required to have a website for each parish. There is even a website (prihod.ru) among the parishes, where you can create a website for yourself, launch it having free hosting, etc."* (Roman, 36 years old, archpriest, Father Superior of the Sergius of Radonezh church, Astrakhan region). He also noted that he had tried to launch the site of his parish himself, but later they confined themselves to a social media group (Sergius of Radonezh church, 2019).

Online religion

Another important segment of the Russian religious space is virtual online cults. By them we understand religious resources and cults that are not historical and traditional for Russia, have arisen on the Internet and exist there; they can later be formed in real life or, on the contrary, transfer their existence primarily to the Net. The Russian segment of this space can be divided into several types. These are Russian versions of Western cults (Russian Pastafarianism) or movements that one day are called religions another day – subcultures. They can be associated with fictional movie characters (Jediism) or synthesized pop-idols-vocaloids (Hatsunism). There are Russian religious online products as well. These are mostly cults of newly-appeared charismatic leaders. Some of them are created by the leaders themselves, e.g. by Sergey Shidlovsky (Movement of God Seekers), A.Yu. Popov (Church of God Kuzya), while the others are formed by a group of people in the honour of already late celebrities like a Soviet actor Aleksandr Abdulov (Abdulovera) or living persons (Witnesses of the Coming of Vladimir Putin).

However, this segment of the Russian religious space is in little demand among the younger generation. Answering the question "Do you know any 'virtual religions' that were formed and function on the Internet?" (Table 5), only 6.8% of those who use the Internet said yes. Perhaps it is connected with the respondents' reluctance to come across such content in a virtual network and lack of interest in this phenomenon or closed nature of such religions and access denial for strangers.

Question	Response option	Answer %
Do you know any 'virtual religions' that have been formed and function on the Internet?	Yes	6.8%
	No	93.2%

Table 5. Awareness of Virtual Religions

The focus group interviews, conducted within the framework of the study, allowed to determine the level of awareness and the attitude of students to such online cults. Most of the participants considered that they have the right to exist, but the attitude towards them is generally indifferent (Tables 6, 7, 8).

MODERATOR	***Do you think a religion can be virtual in general or it is not a religion for you?***
Daria, 18 years old	- Yes, why not
Darina, 20 years old	- Nothing wrong
Alexandra, 19 years old	- I think that any religion happens to be
Andrey, 19 years old	- Yes, the main thing is to believe
Julia, 18 years old	- Yes, someone goes to church or mosque, while others visit a website. Does it really matter?

Table 6. Opinion on the possibility of a religion to be virtual

MODERATOR	***What form can a virtual religion take? What can it be expressed in?***
Darina, 20 years old	Well, for example, a portal ...
Daria, 18 years old	Followers, ideology ...
Anastasia, 19 years old	Well, subscribers
Andrey, 19 years old	A kind of virtual source
Julia, 18 years old	A website or social media page

Table 7. Variability of forms of virtual religion

MODERATOR	***Well, what do you think of such religions?***
Julia, 18 years old	I don't care
Anastasia, 19 years old	Indifferently
Alexandra, 19 years old	On the one hand, I am fine with this, but on the other hand, it is strange for me, the main thing is that it mustn't make any harm
Andrey, 19 years old	I don't care
Darina, 20 years old	Indifferently
Daria, 18 years old	Indifferently

Table 8. Attitude towards virtual religions

In our opinion, the reason for such an attitude is, on the one hand, relatively low popularity of such religious systems in RuNet, as well as lack of awareness among the informants. On the other hand, it is connected with the fact that such religions often have a small number of followers. Besides, traditional religions in Russia have a stronger impact on different spheres of life. According to the informants, such religious systems are embodied in the form of an Internet portal or page in different social networks. Despite the fact that the majority of focus group participants distinguish between the values of

traditional and virtual religions, the attitude to the latter is very tolerant. If someone from their friends join an online religion, it will not affect their relationships.

The analysis of expert interviews confirmed relatively low awareness of the clergy and their flock about online religions. Almost all the experts are poorly aware of the existence of virtual religious associations in RuNet, cannot name the existing virtual religions and have no idea about the attitude towards such new formations.

Conclusion

The information age has generated a wide variety of completely new social and cultural phenomena that have a significant impact on modern society and lead to transformation and, in some cases, to transgression of traditional social institutions. Being one of the oldest and most important institutions for *Homo sapiens*, religions are also under certain pressure and, in some cases, have to transform, adapting to the rhythm and challenges of the modern digital era. Each of the world religions forms its own system of answers, which is determined, in particular, by the specificity of geographical and cultural factors of certain regions. An example of one of these global challenges, according to the authors of the article, is the processes associated with culture virtualization and the influence of this phenomenon on transformation of the religious identity of youth, belonging to Generation Y, which leads to departure from conventional channels of communication and transfer of religious experience in the context of religions that are traditional for Russia.

The studies on the religious identity of young people, conducted by the authors of the article in the framework of various projects in 2015 (M.S. Topchiev, V.S. Dryagalov, O.S. Yakushenkova, 2016) and 2018 (E.V. Kudryashova, V.S. Dryagalov, D.A. Chernichkin, A.V. Rogov 2019), with the sample size of 433 and 350 respondents respectively, demonstrated the dynamics of reducing the number of respondents aged from 18 to 25, who considered themselves practising a religion, from 65.3% to 56.8%. In addition, within the framework of the studied issues, it is important to note that among young people the number of those who haven't made a decision yet increased from 6.7% to 15.3%. The reduction in the level of religiosity in the youth environment is also subjectively felt by youth representatives living in Southern Russia. In particular, the focus-group participants among the student youth, mainly from Astrakhan region, attributed the older generation to the religious and practicing, middle-aged people to religious but not practicing, and young people, i.e. their peers, to non-religious.

The importance of this issue is confirmed at the expert level. In particular, the representative of the Russian Orthodox Church points out serious difficulties in communicating with young people, both at regional and at national level: "*... yes, I know for sure that today, at least in the Russian Orthodox Church, there are serious difficulties in communicating with young people. We don't know our youth, they don't know us, and this is confirmed by the fact that a new concept of working with young people in church is being actively adopted, that is, a new document is being issued. In general, it is thus recognized that the work of the last 10-15 years resulted in nothing, though we were talking about missionary work, the church almost quit the mission, I think, and switched its missionary efforts to youth work ... And in the Orthodox environment, for example, I meet increasingly rarely children with gadgets that think independently and creatively... Basically these are people who want to be led; they want to take their place in the community. Some guys who want to create something, and it is hard for them because they understand that everything here is by the rules, and they shouldn't go there. And the student community consists of that sort of people and we cannot find an approach to them...*" (Roman, 36 years old, archpriest, Father Superior of the Sergius of Radonezh church, Astrakhan region).

The representative of Adventism also talks about the problems of youth outflow from churches. He connects this process with over-involvement of young people in virtual social networks, which, he says, replace all communication and take a lot of time: *"... it is a global problem, it exists; when it is a matter of replacing communication, it is a real problem. When it comes to combining communication, this is good. Again, I even see young people who have this problem when this replacement takes place. It is bad, but I see cases when, say, there are individuals who combine it. And this is good ... Another question is time. When the Internet takes time from something useful and necessary, this is a problem..."* (Aleksandr, 44 years old, pastor of the Seventh Day Adventist Church, Astrakhan).

Almost all the interviewed experts agree that the development of religious systems does not keep pace with the development of the level of youth consciousness. Clerics have to adapt to a constantly accelerating pace of development of society, including in virtual space, in order to get the youth somehow interested in religion. Despite the fact that, as noted above, each of the world traditional confessions forms its own system of answers, this problem is global and can lead to transformation of a whole cluster of interconnected social institutions. In this regard, the analysis of the influence of digital media on formation of the religious identity of Russian young people is an urgent and timely challenge for scientists and researchers. This article poses new problems, related to finding answers to another challenge of the information age in connection with getting to a new international level.

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Online-learning at ISCTE-IUL: towards a sustainable education paradigm

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Introduction

In the past, the access to education in general and higher education in particular was lined with geographical barriers that prevented long-distance students from accessing quality education. With the advent of the Internet, these geographical barriers disappeared and new education paradigms, such as online-learning platforms, were born and changed the way education was made available to everyone in the last decades (Bates 2005). Although these platforms make an important contribution to empowering individuals from all over the world to engage in learning activities that can change their lives (especially in developing countries), there is another aspect of this education paradigm that is often overlooked but that has a similar positive effect in the world: the contribution that the use of these platforms makes regarding a more sustainable environment (Baragash and Al- Samarraie 2018; Bosch, Mentz and Reitsma 2019). This is clear when considering, for example, the amount of scarce or environmentally-costly resources that are saved, such as, energy used in classrooms or the transportation means used to travel to the university.

This study aims to analyze the sustainable potential of blended-learning model used in a Portuguese higher education institution. Based on this objective, we formulate the following research questions: what are the main features of ISCTE-IUL online learning platform? What are the main economical and environmental impacts of using a blended-learning approach? And why should the blended-learning model be considered a sustainable teaching model?

At ISCTE-IUL, a public University in the city of Lisbon, in Portugal, the use of this kind of online-learning platforms has been present for more than a decade, with frequent evolutions and changes to further adapt to the demands of a constantly evolving and deeply web-connected student population. In the beginning, these tools were used merely as a way of providing additional resources to the on-site classes that students attended. These ranged from class slides and notes to multimedia files and other useful resources. In the last few years, however, these tools have been used to provide a way to actually replace some of the on-site classes, thus allowing students to have full autonomy regarding the time and place in which they engage in the learning process.

Our research seeks to contribute to improving the quality of future studies related to the impacts of sustainable online-learning approaches in higher education institutions as well as to the ongoing debates by scoping the concept of sustainability in blended-learning and by presenting, through a specific case, how the blended learning model can help institutional environments become more sustainable. This research is also relevant as it helps to develop a coherent body of knowledge about a sustainable blended-learning model.

To date, there is little research about blended-learning sustainable practices and their impacts on institutional contexts. Even though sustainable blended-learning research is recognized, it is still limited. Contributions to sustainable online-learning approaches focus more on education for sustainability assessing the level of efficacy of online-learning programs in teaching and learning for daily sustainable practices than on sustainability education and how the adoption of sustainable online-learning strategies can improve the performance of variables such as resource management, educational attainment, and professional development and innovation.

We believe that the originality of this study lies in the fact that it attempts to show how blended-learning can contribute to the sustainability of higher education institutions focusing on a real higher education institution where the impacts of using a sustainable blended-learning model have been felt.

In this paper, we start by introducing the blended-learning approach and its contributions to a sustainable education paradigm. Then we present the online-learning platform that has been in use at the University since 2015, which has contributed to reducing the number of on-site classes. We also show how this has, consequently, contributed to reduce the University's environmental impact while also helping to reduce the inherent costs of operating on-site classrooms.

Blended-Learning as a sustainable learning paradigm

Blended-learning (also referred to as "b-learning") was initially defined as a way to "blend text-based asynchronous Internet technology with face-to-face learning" (Garrison 2004) and, since then, has been touted as an approach that challenges the traditional classroom paradigm by combining the best of on-site classes with online based classes and that positively contributes to improve information retention (Sembiring 2018), learning performance (Baragash 2018), learner motivation (Bosch 2019), learner satisfaction (Kintu 2017) and sense of empowerment (Owston 2018).

On one hand, online-based learning, which is mainly used for theoretical exposition, is very important to enable students to autonomously manage the time they dedicate to learning (especially if they have to do it while working part or full-time). On the other hand, on-site laboratory, practical and group discussion classes contribute to providing students with a medium to further explore a specific topic from the online classes or simply engage in meaningful interactions with their colleagues to enhance the learning experience.

What makes blended-learning particularly effective is its ability to balance the open communication and the synchronicity of on-site classes with the limitless access to all kinds of information and media formats of the internet. In essence, students make use of online resources to bootstrap their learning processes while being a part of a community of learners that can also engage in on-site classes with instructors prepared to guide them through the learning process.

While all of this is clearly important as a way to improve the learning process, the benefits of this kind of learning approach that is based on online tools extends to more than increasing learning performance, motivation and satisfaction. An online-based learning environment is in its essence an eco-friendly learning environment, by helping to construct a resource-saving and resource-optimizing society (Yao 2019).

The increasing interest on distance learning programs has emerged not only as a response to the rapid evolutions of Information and Communication Technology (ICT) in the field of education but also as a partial solution to the unsustainability of Higher Education sector that constantly has to deal with external drivers, such as societal and technological changes, quality standards by ensuring efficient and effective teaching and learning, and financial issues (Stewart and Khare 2014). Thus, the success of those programs and their sustainable design are concerns for educational institutions regarding the achievement of quality management and cost-effectiveness.

The issue of sustainability in education has developed around two approaches: education for sustainability and sustainability of education. In this paper, the main focus is on the latter approach, which is based on the implementation of sustainable practices through educational development, leadership, and innovation (Davies & West-Burnham 2003).

According to Sahid, Endut and Peng (2003), sustainability reflects a practice which supports long-term innovation processes and at the same time benefits people, the economy and the environment. However, the implementation of a sustainability paradigm also causes social, technological and organizational changes influencing the way people work, the economic dynamics and the environmental impacts. Although there is some diversity of definitions around the concept of sustainability, there is also common agreement about its continuity over time maintaining the same degree of efficacy and the long-term viability and stability of online learning programs (Casanova and Price 2018).

In order to ensure the sustainability of learning innovation, such as in the blended-learning model, one must guarantee that it should be designed according to a macro institutional level with a governance that provides a top-down approach; an appropriate financial support; a stakeholder-focused perspective; an institutional strategy based on teaching excellence and promotion of its adoption providing technical and pedagogical support. Thus, it is necessary to ensure that these conditions are met before, during and after the implementation phase of the online learning projects while contributing to improve students' satisfaction with learning processes and their learning outcomes as well as responding to the expectations of the remaining stakeholders, such as staff and faculty (Chipere 2017). At the same time, it also needs to address other issues, such as the broadening of the scope of the online learning projects and supporting their implementation through institutional processes and policies; the stakeholders' acknowledgement of their relevance in their day-to-day procedures, and an institutional culture oriented towards continuous improvement and recognition of the benefits of personal development (Bates 2005; Price, Casanova and Orwell 2017). Otherwise, the success and sustainability of online projects will be compromised.

From the higher education institutions standpoint, a sustainable blended-learning model can provide a quality, lifelong education and flexible, cheaper and richer resources than those used in the traditional classroom. Besides improving an institution's profit by using low-cost technology and reducing the costs associated with teaching and learning initiatives, this learning model reduces the ecological impacts of education as it saves time and resources, including physical, energy and human resources, and it contributes to significantly decrease the need for printing through digitization of documents, module study guides, lecture notes, papers and other support material or making them available through online tools and platforms (Sofiadin 2014; Ahmad et al. 2018; Casanova and Price 2018).

As Sofiadin (2014) pointed out, the possibility to reuse, transfer and share learning contents is one of the characteristics of online learning projects. In the case of the blended-learning model, these actions are complemented by classroom lessons which allow personalized clarification of questions, queries and feedback as interaction between teacher and students contributing to reinforce this relationship.

According to the study conducted by Stepanyan, Littlejohn and Margaryan (2013), sustainable online programs can be analyzed through three domains: resource management, educational attainment, and professional development and innovation. In resource management's domain, the costs of online learning programs as well as return on investment are relevant topics. Factors like the quality of teaching/learning, the number of students, and technical and pedagogical innovation are useful to assess the level of cost-effectiveness of online learning programs, such as e-learning or blended-learning. In order to save resources, Littlejohn (2003b) advocated the reuse principle in order to produce an economy of scale of reusable educational resources as an approach to reduce staff time.

While some authors recognize the importance of a set of measures such as retention rates, students' achievement, skill acquisition, personal development, evidence of benefits, and perceptions of quality to achieve more sustainable online learning programs, other authors focus on the institutional adaptation to the external constraints, the need for culturally and physically institutional restructuring,

and a shared vision as facilitators of sustainable practices in higher education institutions (De Freitas & Oliver 2005; Gunn 2010).

Online-Learning Platform

The online-learning platform in use at ISCTE-IUL was developed by the in-house information systems development team at the University and aims to provide a way for teachers to have part of their classes (in particular, the ones with theoretical exposition) taught through an online medium. As depicted in Figure 1, the platform is responsive and adapts to different types of devices (with varying dimensions), allowing students to take the online classes on whatever device they have on them at the time.

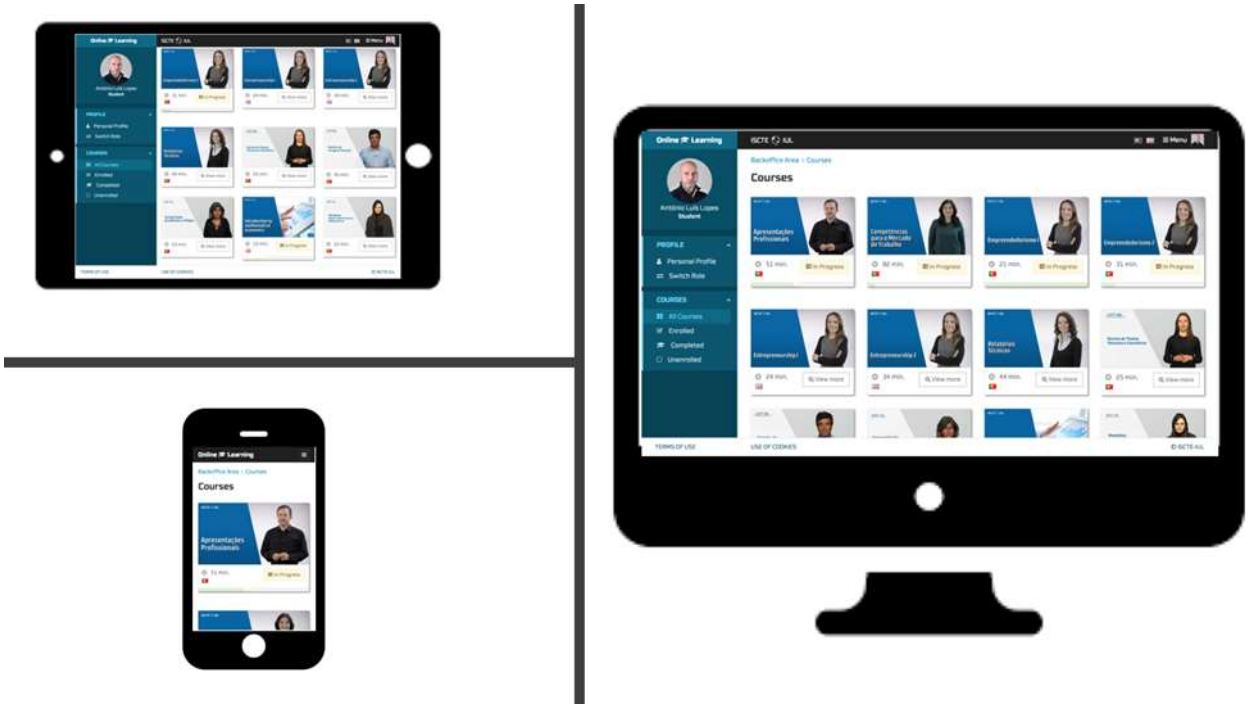

Fig. 1. The online-learning platform in use at ISCTE-IUL adapts to different types of devices

Each course is composed of a set of modules in which each module features a video and an online quiz that students use to gauge their understanding of the module's content. Teachers can decide if a passing grade on the online quiz of a particular module is necessary to go through on to the next module.

There are several types of online courses at the platform and their aims differ depending on the goals that each teacher has set for their courses at the University:

- Mandatory online courses: these are the online courses that act as a basis or an introduction for a particular course at the University. Students have to complete the online classes in order to attend on-site classes or complete the actual course at the University.
- Complementary online courses: these are online courses that complement the on-site classes of a particular course at the University but that are not mandatory. Students use these online courses to explore some extra details of the on-site classes or to simply leverage the online quizzes as a studying tool.
- Online-only courses: these online courses do not have a corresponding course at the University. They are merely used as an isolated (usually general-purpose) course that students can enroll to enhance their knowledge at different areas.

At the time of this study (March 2019), there were 13 courses at the platform taught in Portuguese and 4 courses taught in English. These courses' themes are mostly related to soft-skills such as learning how to do presentations, write scientific documents and develop entrepreneurship and communication skills but there are also technical courses such as mastering Microsoft Excel, mathematical economics and human resources management. Of the 6641 students that enrolled in some online course (since 2015), 81% (5381 students) have completed the courses so far. The average age of the students enrolling in these online courses is 19 years old.

Of the total of 6641 students, 2145 have answered an online survey after the completion of the course. This sample is characterized as follows:

- 52% are female (and 48% are male)
- 99% are actual students at the university (the remaining 1% are alumni, staff, researchers and others)
- 96% are Portuguese (the remaining 4% are from other nationalities from more than 10 other countries)
- 8% of the students are also are working full or part-time
- 6% of the students attend night classes

The survey's results allow us to assess their opinion regarding the usefulness, efficacy and importance of using the online-learning platform and the blended-learning model. The answers are measured in a scale of 1 (fully disagree) to 5 (fully agree) regarding their agreement to a set of statements.

Regarding the online classes and the online-learning platform, the students agree that these are important (4.3) and useful (4.6) in the learning process, especially due to the given autonomy to decide when and where (4.6) to take these online classes. Regarding the on-site classes, the students also agree that these are important (4.2) and useful (4.2) in the learning process. When referring to the possibility of applying the blended-learning model to other courses in the University, the students agree (3.9) that this should be extended to the totality of their courses.

Results and Discussion

In this study, we seek to determine the economical and environmental impact of using an online-learning platform in the context of a blended-learning model. The period to which the study refers to is between September 2015 and July 2018 (comprising the academic years from 2015/2016 to 2017/2018), but we also include the period regarding the academic year for 2018/2019 even though this is still ongoing (the value for the reduction of teaching time for this period is therefore planned – the number of enrollments is real because this has already taken place in the beginning of the academic year).

We analyzed ten courses from the soft skills area on this study. All of these courses are taught in the blended-learning model as mandatory online courses, i.e. students must complete the online modules and attend the on-site classes in order to pass the entire course at the University. The number of hours that were reduced in classes (and their corresponding percentage of the total teaching time for those courses) as a result of applying the blended learning model is presented in Table 1. These hours reflect the number of hours that would be necessary for teaching the same modules that are present in the online classes but in on-site classes with theoretical exposition for all enrolled students.

	2015/2016	2016/2017	2017/2018	2018/2019
Teaching time reduction (in hours)	619	725	808	802

Time reduction as percentage of total teaching time	46%	46%	46%	44%

Table 1. Reduction of teaching time in hours and percentage of total teaching time from 2015/2016 to 2018/2019

The courses in this study involved 6231 enrollments in the period under analysis. The distribution of enrollments per academic year is presented in Table 2:

	2015/2016	2016/2017	2017/2018	2018/2019
Enrollments	1383	1498	1606	1744

Table 2. Enrollments in the courses in the study from 2015/2016 to 2018/2019

In the four academic years under analysis, the online courses that were analyzed were responsible for a reduction of 2954 hours (the sum of the values in Table 1's Teaching time reduction row) of teaching time in on-site classes. That is a reduction of 46% of the total teaching time – if we consider the courses were taught in a traditional model of on-site classes only. In order to calculate the impact in actual cost reduction, we used the following assumptions:

- The hourly cost of a classroom in terms of occupancy and the consumption of resources (energy, cleaning, maintenance, user support) is estimated at 25€ (value provided by the infrastructure and maintenance team at the University). For the total of 2954 hours in this study, this means a cost reduction of 73 850€.
- The hourly cost of the teacher is calculated by dividing the average gross income of an Assistant Professor (including paid vacation, taxes and other income elements) with the total of contractualized hours. To that effect, we also consider that one hour of teaching that was reduced includes 3 additional hours of preparation of the subject. This amounts to an hourly cost of 140€, which for the 2954 hours of the study means a cost reduction of 413 560€.

In total, it is estimated that the savings achieved with the reduction of the use of classrooms and teaching time, in the period under analysis, amount to **487 410€**, close to half a million Euros.

Besides the economic impact revealed by the results shown above, it is clear that the reduction of face-to-face classes also produces environmental benefits. These are caused by the lower consumption of energy in on-site classes and by the reduction of the damaging gas emissions as a consequence of having fewer commutes to and from the University by the students and the corresponding teachers. Quantifying this kind of indirect benefits is very difficult and would require having concrete information regarding the energy consumption in the University campus and traveling habits of students and teachers.

Therefore, we can only estimate these values based on some assumptions. Consider the following:

- Based on recent surveys to the students, the average distance that ISCTE-IUL students travel from and to the University is 12.5km (per commute), in which 70% use public transportation, 17% use their own car, 12% use bicycles or on foot and 1% use motorbikes;
- Based on information from the European Environment Agency (2016) and considering the survey results depicted on the previous point, the average emissions for a student to commute to the University and back to their residency is 1.51 Kg CO^2;
- If each face-to-face class has an average of 20 students and a duration of 1.5 hours, the total CO^2 emissions that are saved per 1.5 hours of classes is 30.2 Kg;

- Therefore, for the entirety of the period of the study, the reduction in emissions amounts to almost a total of **60 tons of CO^2**.

According to these results, we conclude that blended-learning is a sustainable learning approach concerning money and time savings, hence being more cost effective than face-to-face learning and has some positive environmental benefits. This evidence was acknowledged by Bartley and Golek (2004) who pointed out the ability of online learning programs to reduce costs as well as to transfer material in an efficient way. However, organizations should assess the costs of online learning programs as it helps to decide what kind of models are more appropriate for them and which implementation will be aligned with institutional learning strategies.

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GFIC Global Forum of Intellectual Capital by ICAA

Competitiveness and Intellectual Capital of Nations: Reviewing the role of conditions for innovation, sophistication and austerity measures.

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1. Introduction

The wealth of a nation is usually based on tangible goods. In the Western world, capital is analyzed from the perspective of financial capital, while in Eastern countries, the main understanding of capital is based on property. However, a new vision of wealth and growth is being widely discussed: knowledge-based growth (Lin and Edvinsson, 2010). Accordingly, the need arises to understand these new types of capital and their importance for the growth of the nation and for the national competitiveness.

Malhotra (2001) reports that the traditional assessment of national economic performance was based on understanding the growth of the Gross Domestic Product (GDP) in terms of traditional factors of production: land, labor and capital. Due to this new perspective given to the growth and wealth of a nation, one can see the rapid growth of nations with high investments in information and communication technologies.

Intellectual capital was defined by Stewart (1997) as intellectual material, knowledge, information, intellectual property and experience. These skills can be put into practice to create wealth. Edvinsson (1997) recognized intellectual capital as a set of intangible assets: resources, skills and capabilities, which not only increase organizational performance, but also bring about the creation of value.

In recent years, a growing number of individuals and groups have shown interest in studies on intellectual capital, not only scholars and managers of major organizations, but also government agents in their decision-making regarding public and development policies of countries (Lin & Edvinsson, 2010a). However, most of the studies related to intellectual capital have been analyzed for the interest of organizations, aimed at explaining the differences between book value and market value and to show a possible source of competitive advantage at companies (Bontis, 2001; Edvinsson, 1997).

There are emerging approaches that attempt to apply this methodology more broadly, in order to compare intellectual capital at the national level. These approaches are attempts to apply the models created for organizations to national levels. (Lin and Edvinsson, 2010a)

The concept of intellectual capital is a new way of thinking about new forms of economic wealth. Knowledge is considered the basis for achieving success and competitive advantages (Bontis, 2004; Edvinsson, 2004; Malhotra, 2001). In the knowledge-based economy, the wealth created by a nation is directly linked to knowledge and intellectual capital. The main point is to show that this intellectual capital generates growth, wealth and competitiveness (Bronisz et al., 2014).

The main objective of this study is to analyze the influence of intellectual capital and its components on the national wealth of European Union countries; the specific objectives are to present the main models of intellectual capital at the national level, the main metrics for measuring competitiveness of the development of a new conceptual model proposal that seeks to show clearly the national wealth, and to perform the econometric analysis of all the components using the panel data methodology.

2. Literature Review

National intellectual capital is recognized as the most important source of productivity and competitiveness of a nation. Several organizations, including the World Bank, recognize that investment in intellectual capital is a crucial factor in determining national wealth, economic growth, job creation, and citizens' standard of living (Uziene, 2014).

2.1. Financial Wealth (Financial Capital)

The wealth of a nation has always been based on tangible goods. In the Western world, capital boils down to financial capital only. For Eastern countries, the main understanding of capital is land. However, with this paradigm shift, and the need to understand the new types of knowledge-focused capital, nations are increasing their spending on welfare, health, education, R&D, and security. (Lin & Edvinsson, 2010)

For Bontis (2004), the main metric used to demonstrate the financial wealth of a nation is its GDP per capita. According to Lin and Edvinsson (2010), financial capital is expressed by GDP, external debt, industrial production, and inflation.

Lin and Edvinsson (2008) compared the intellectual capital of 40 countries using 29 indicators, and analyzed the economies of the Nordic countries between 1994 and 2005. Analyzing the sub-indices of intellectual capital, one can see that financial capital ranks first among all types of capital, i.e., financial performance is the greatest benefit of these countries.

For Lin and Edvinsson (2010), financial capital is represented by a single indicator: the logarithm of GDP per capita adjusted by purchasing power parity. They consider this to be the most common measure of a nation's financial wealth.

Bontis (2004), in his analysis of the intellectual capital of the Arab countries, assessed the financial capital of Arab countries versus OECD member-countries and found that the average per capita GDP of the Arab countries in 1999 was USD 7,238, while GDP per capita of OECD member countries was USD 22,020. Then he analyzed that 20% of the power of explanation of financial wealth is assured by intellectual capital.

Uziene (2014), in the analysis of the intellectual capital of the Baltic countries in relation to 28 European countries plus Norway between 2007 and 2011, used GDP per capita for the analysis of financial capital and found – among the countries analyzed – that Estonia has the largest financial capital, in line with the best intellectual capital result of the region.

2.2. National Intellectual Capital: Types of capital

The initial studies of national intellectual capital basically consist of the application of the models used in organizations transformed into models used in each country. Due to the fact that intellectual capital is recognized as a major factor in determining a nation's growth, studies at the national level have begun to gain strength and have become a new area of study, with a primary focus on understanding and measuring the intangible factors that influence the wealth of a nation (STAHLE & STAHLE, 2006).

The intellectual capital of a nation requires the articulation of a system of variables that makes it possible to discover and analyze a country's intangible wealth (Bontis, 2004). There are countless

models that have been developed, although there is no definition of which model is most appropriate and most clearly represents the intellectual capital of nations. The subcomponents that form the intellectual capital are discussed by several authors, and each model presents a specific way of demonstrating the components of intellectual capital.

The main models used to analyze the intellectual capital of nations were derived from the *Skandian Navigator* organizational model. In 1996, the Swedish government produced a report titled "Welfare and Security" whereby it was possible to see the analysis of the country's hidden wealth using the model developed by Edvinsson (1997).

Andriessen and Stam (2004) conducted a study on the intellectual capital of the European Union aimed at assessing the level of European intellectual capital based on the priorities defined at Lisbon Agenda. The authors concluded that three groups of countries can be identified: "The leaders," "The challengers," and "The laggard." When comparing with United States and Japan, it is possible to find a delay on the part of the member-states of the European Union.

Seleim and Bontis (2013) examined the relationship between intellectual capital and economic performance in 148 developing countries, and the results showed that national intellectual capital can account for 70% of the variation in the economic performance of these countries.

Ruiz et al. (2011) applied the proposed model to 82 countries, based on the availability of data, analyzing the period of 2006. The results showed that the countries with the highest intellectual capital were Luxembourg, Iceland, the Scandinavian countries, the United States, the United Kingdom, and Ireland, while the countries with the lowest intellectual capital were the countries of sub-Saharan Africa, with the exception of South Africa.

Lin and Edvinsson (2008) adapted the organizational model and separated intellectual capital into human capital, market capital, process capital, renewable capital, and financial capital. The authors compared the intellectual capital of 40 countries using 29 indicators and analyzed the economies of the Nordic countries between 1994 and 2005. The results confirmed the perception that the Nordic countries have a high level of national intellectual capital.

Malhotra (2003), Bontis (2001; 2004), Lazuka (2012), Phusavat *et al*. (2012), and Spahic (2014) believe that a nation's wealth is composed of financial wealth and intellectual capital, using the model created by Bontis (2001), with two levels of subdivision of intellectual capital. First, intellectual capital was divided into human capital and structural capital. They then subdivided structural capital into market capital and organizational capital, and finally, organizational capital was separated into renewable capital and process capital. Thus, the following hypothesis is raised:

Hypothesis 1: Intellectual capital positively influences national wealth.

2.2.1. Human Capital

Knowledge gained throughout one's life, citizens' knowledge, skills and abilities, education, and creativity are known as human capital. They are the individual skills that make it possible to reach the national goals (Bontis, 2004; Navarro et al., 2011).

Andriessen and Stam (2004) conducted a study on the intellectual capital of the EU aimed at assessing the level of intellectual capital based on the priorities defined in the Lisbon Agenda, and found a correlation between per-capita GDP and structural capital. No relationship between per-capita GDP and investment in human capital was found. They concluded that, in per-capita terms, richer countries do not invest more in human capital than poor countries, but in absolute

terms the investment of the rich countries is higher. Stam and Andriessen (2009) made the same type of analysis and verified that there is a statistically significant correlation between investments made in human capital and the level of intellectual capital. Moreover, they noted that human and structural capital go hand in hand.

Bontis (2004), when analyzing the intellectual capital of 10 Arab countries, concluded that human capital is preponderant for the prosperity and financial wealth of a nation, and that 20% of the explanation power of financial wealth is associated with intellectual capital.

Seleim and Bontis (2013) examined the relationship between intellectual capital and economic performance in 148 developing countries, and the results showed that a nation's human capital correlates positively with economic performance and structural capital.

Uziene (2014) sought to analyze the peculiarities of the intellectual capital of the Baltic countries compared to 28 European countries plus Norway, from 2007 to 2011. The results showed that Estonia is the leader among the Baltic countries, often ranking above the European average. This leadership is due to the country's ability to maintain a high level of human capital, among other factors.

Schwab (2016) points out the importance of human capital in supporting structural changes and revitalizing industry. Nations need to be concerned with education, skills and the labor market to increase productivity and, consequently, competitiveness. Thus, the following hypothesis is raised:

Hypothesis 1a: Human capital positively influences national wealth.

2.2.2. Structural Capital

This type of capital is denominated by the mechanism and structure of an organization that provides and supports employees to optimize intellectual performance. (Bollen *et al*, 2005). For Edvinsson (1997), structural capital is a set of non-human knowledge, stored in an organization's systems, databases and programs. Bontis (2004) adds that an individual in an organization can never reach the maximum potential of its system if the procedures used are unsatisfactory. Ruiz et al. (2011) applied the model proposed in 82 countries, based on the availability of data, analyzing the period of 2006, and found that for the countries analyzed, structural capital represents 96.6% of intellectual capital, whereas human capital represents only 3.4%. Malhotra (2003) defines structural capital as the intellectual capital that is not visible in the national organization and in its technological structures, corresponding to the knowledge assets left over, without considering human capital. For Malhotra (2003) and Bontis (2004) structural capital is composed of organizational capital and market capital. Unlike human capital, structural capital can be an integral part of a nation and can be traded.

For Edvinsson (1997), organizational capital – a component of structural capital – is composed of parts of what was created by the organization through the use of human capital. For Malhotra (2003) and Phusavat et al., (2012), organizational capital is the capacity conferred by: organizational structures; hardware; software; databases; patents; trademarks and anything else that can support innovation and productivity as well as provide and convey knowledge. Malhotra (2003), Bontis (2001; 2004), Lazuka (2012), Phusavat et al. (2012), and Spahic (2014) still consider that organizational capital is composed of process capital and renewable capital, and process capital encompasses the non-human knowledge resources of a nation, integrated

with the country's infrastructure (Lin & Edvinsson, 2010). Renewable capital, on the other hand, reflects the current capacity and investments for future growth.

Structural capital represents institutionalized knowledge and codified experience stored in databases and files that a country can accumulate. Additionally, it reflects the capacity for innovation and the effort to achieve high scientific and technological progress, which will result in structural capital and knowledge. This type of capital is obtained through research and development activities, resulting in patents granted and royalties received (Seleim & Bontis, 2013). Thus, the following hypothesis is raised:

Hypothesis 1b: Structural capital positively influences national wealth.

2.2.3. Relational Capital

Market or relational capital resembles external relationship networks and social capital, i.e., it represents the capability and success of a nation to offer incentives and attractions to meet the needs of international customers, while exchanging knowledge with the rest of the world. This type of capital shows a country's competitiveness on the foreign market, which can be measured by investments in international relations and exports of high-quality goods and services (Malhotra 2003; Bontis, 2004). Malhotra (2003) adds that such relationships between countries reinforce the ability to create value through knowledge.

Andriessen and Stam (2004) analyzed the intellectual capital of the European Union between 1999 and 2001 and found that there is no significant correlation between relational capital and other types of intellectual capital. Stam and Andriessen (2009) made the same analysis from 1995 to 2007 and found that structural capital and relational capital go hand in hand. Bontis (2004), in his analysis of the intellectual capital of Arab countries, found that there is a positive association between market capital and process capital, as well as between market capital and financial capital. Weziak (2007) indicates that national relational capital facilitates cooperation and relations between nations, promoting the improvement of economic development. The ability of a nation to have high relational capital can also be expressed in the form of its ability to attract foreign direct investment.

Seleim and Bontis (2013) define relational capital as the knowledge embodied in the relations of nations with the rest of the world's economies, representing the values of relations between companies, governments and trading partners. They also examined the relationship between intellectual capital and economic performance in 148 developing countries. The results showed that there is a positive correlation between structural capital and relational capital, relational capital and economic performance, relational capital and structural capital, and relational capital and human capital. In other words, investments in relational capital bring benefits to economic performance, human capital and structural capital. In this way, the following hypothesis is raised:

Hypothesis 1c: Relational capital positively influences national wealth.

2.3. Competitiveness

The term competitiveness is widely used in several lines of research, usually with the aim of understanding how to improve economic well-being and wealth distribution. According to Martin

(2003), the main schools of economic thought implicitly or explicitly bring the notion of national, regional and business competitiveness.

The classical theory, with the view of Adam Smith (1776) that the division of labor was considered an important factor for economic growth, was based on free competition and its benefits for technological innovation and society. David Ricardo (1817) expounded his theory of the value of labor and the benefit of comparative advantages for international trade. Neoclassical theory advocated the maximization of utility and profits, demand and supply, and marginal utility.

For microeconomics, competitiveness is analyzed based on a firm's ability to compete, grow, and be profitable. At the corporate level, competitiveness is expressed by a company's ability to attend to the market with competitive prices and quality while remaining profitable. The more competitive the company is in relation to its rivals, the greater its capacity to grow and increase market share and, on the other hand, non-competitive companies tend to lose market and consequently do not have continuity (Martin, 2003). For macroeconomics, the concept of competitiveness has several understandings. However, most believe that competitiveness is based on the relationship between government, society and companies, with the goal of generating economic growth (Martin, 2003).

Fagerberg (1988) argues that the main approaches to understanding the competitiveness of nations are the analysis of differences in growth of labor costs, which is considered the main factor affecting the difference between competitiveness and growth between countries. However, the results of his study suggest that the main factors influencing the competitiveness and growth of nations are technological competitiveness and the ability to attend to the market.

Porter (1990) defines competitiveness as a multidimensional concept that involves different aspects, competitive advantages, commercial strategy and results, among others. Prosperity is not inherent, but rather created, and dependent on the ability to innovate and improve. According to Porter (1990), there is no consensus on the meaning of national competitiveness. A nation's primary goal is to provide a high and growing standard of living for the population, which depends on the ability of corporations to achieve a high level of productivity.

For Krugman (1994), trying to define the concept of a nation's competitiveness is much more problematic than defining business competitiveness. The main purpose of a corporation is profit; it must have a positive outcome to pay its suppliers, employees and other liabilities, otherwise it will cease to exist. On the other hand, countries that are not competitive will continue to exist, irrespective of their economic performance. The result of the trade balance may represent a sign of the competitiveness of nations; a trade surplus may be a sign of weakness of the national economy and a deficit may be a sign of a competitive economy.

The European Commission has shown interest in studying competitiveness of countries and regions belonging to the European Community. Every three years, the degree of evolution of the region's competitiveness is analyzed. When analyzing the period between 1980 and 2003, econometric tests showed that the productivity, measured by GDP per capita, is convergent among the regions analyzed. There is a positive effect on the intensity of spending on research and development. However, it was not possible to verify the effect of human knowledge, investment in infrastructure, and specialization of the workforce (Martin, 2003)

The definition of competitiveness is not always clear in studies at national level. In some cases competitiveness is used to delineate competitive advantage or even the comparative advantage among nations. Lewis, et al. (2007) define competitiveness as a nation's capacity to produce goods and services with international quality standards more economically than other countries.

Bazavluk (2014) analyzes the competitiveness of Ukraine in relation to other nations by means of determinants of intellectual capital using the NICI40 index, and identifies the relationships between process, market, human, financial and renewable capital, concluding that there is a correlation between intellectual capital and its components, with greater influence of market capital and process capital, and that intellectual capital is one of the main factors that influence competitiveness.

Several countries and institutions seek to measure the level of competitiveness of regions or nations with different objectives. In general, they seek to improve the economic environment. The most used indicators based on the empirical research carried out are calculated by the International Institute for Management Development (IMD) and the World Economic Forum (WEF).

Since 2005, the WEF has published the Global Competitiveness Index (GCI). The Global Competitiveness Report (2016–2017) covers 138 countries. These countries covered by the GCI, jointly, account for 98% of worldwide GDP. The ICG is composed of 114 indicators; statistical data from internationally recognized organizations – IMF, World Bank, UN, UNESCO and WHO – are used to calculate the index. The indicators are grouped into 12 subcomponents: institutions, infrastructure, macroeconomic environment, health and education, higher education and training, efficiency of the market for goods, efficiency of the labor market, development of the financial market, technological availability, market size, business sophistication, and innovation (Schwab, 2016).

When the country develops and reaches the innovation stage, again there is a wage increase that will only be sustained if the economy has more sophisticated production processes and more innovations. The ICG calculation considers the stages of development of the countries analyzed, giving higher relative weights to the pillars that are most relevant to an economy according to their particular stage of development (Schwab, 2016).

To verify the effect of the factors of innovation and sophistication on the intellectual capital and wealth of nations, the following hypotheses are raised:

Hypothesis 2: The factors of innovation and sophistication have a moderating effect on the relationship between intellectual capital and national wealth.

Hypothesis 2a: The factors of innovation and sophistication have a moderating effect on the relationship between human capital and national wealth.

Hypothesis 2b: The factors of innovation and sophistication have a moderating effect on the relationship between structural capital and national wealth.

Hypothesis 2c: The factors of innovation and sophistication have a moderating effect on the relationship between relational capital and national wealth.

The hypotheses related to the components of competitiveness were raised based on the methodology used by Schwab (2016) in his Global Competitiveness Report, due to the availability of the data since 2005 and the agility in the annual update of new indicators. Moreover, the IGC covers 138 countries, based on the availability of data, which jointly account for 98% of worldwide GDP.

2.4. Crisis and austerity

The financial crisis of 2008 turned into a crisis of public and economic debt that strongly affected the European Union, as well as undermined the economy and the labor market of its member-

states. There was a slowdown and stagnation of production in several countries, and a sharp increase in unemployment, public debt and trade deficits. For Leschke *et al*. (2015), in response to the economic crisis, the European Union began to introduce stricter control policies and introduce reforms that would strengthen the region against future crises and manage to contain the public debt crisis, which were threatening the banking systems.

The onset of the economic crisis in the last quarter of 2008 had a tremendous impact on the public financing of European countries. In general, there was a substantial increase in public debt in countries, and in the European Union it rose from 59% in 2007 to 87% in 2012. (Leschke *et al,* 2015). Watt (2011) emphasizes that this increase in public debt reflects the deterioration of government balances, incentive measures to bail out the financial sector, and a decline in GDP.

With the increase in financial support programs and the lack of suitable solutions to overcome the effects of the crisis, debts began to increase. As a requirement for obtaining foreign aid, strict measures were imposed to control and balance the public accounts. These fiscal austerity measures caused some economies to enter a major recession, increasing spending on benefits and cuts in public spending. As a result, the number of bank defaults increased, which further increased the lack of confidence in economic recovery (Leschke et al., 2015).

The austerity programs adopted in late 2010 in many European Union countries envisaged an increase in indirect taxes, which would affect job creation to a lesser extent. However, some countries increased taxes on income and wealth (Theodoropoulou & Watt, 2011). For Heise and Lierse (2011), who evaluated the impact of austerity measures in European Union countries, the economic crisis and the increase in public debt were used as an excuse for cuts in social benefits, which directly affected wages and employment.

The austerity program launched in March 2010 with the “Stability and Growth Programme” (SGP I) was expanded in June 2010 with a new package of measures (SGP II), followed by reinforcement in September, known as SGP III. SGP IV was incorporated by the IMF and the European Union in May 2011 (Costa & Caldas, 2013)

De Grauwe and Ji (2013) analyze the austerity period and the factors that showed a slight increase in the region’s GDP after 2012, and cite the reduction of spending control measures as one of the possible reasons for the resumption of growth.

Thus, in order to analyze the influence of intellectual capital on national wealth and the moderating effects of competition, it is necessary to take austerity measures into account, considering the years 2011 and 2012, which had the most restrictive austerity measures.

3. Proposal of the conceptual model

Based on the foregoing theory about intellectual capital and the competitiveness of the nations, it is necessary to analyze the effect of the components of competitiveness in the national wealth, analyzed based on intellectual capital. Accordingly, three new explanatory components are suggested that can explain national wealth.

Based on the theory and models presented, related to intellectual capital and competitiveness and the predominance of approaches based on the *Skandian Navigator* model, mainly the typology used by Andriessen and Stam (2004), Stam and Andriessen (2009), Seleim and Bontis (2013) and Chahal and Bakshi (2016), once can see the need to analyze the effect of the components of competitiveness on national wealth.

The proposal of a conceptual model used in order to analyze the influence of intellectual capital and its components on the national wealth of European Union countries is presented below.

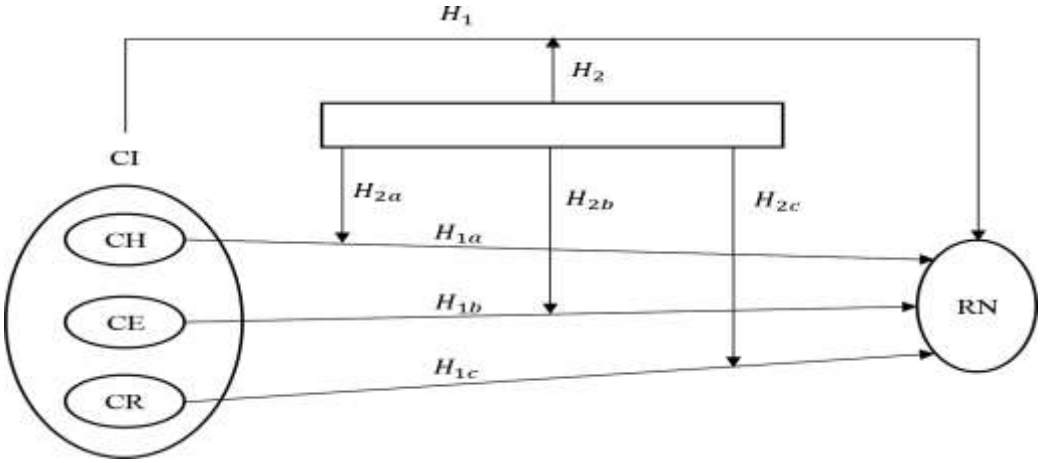

Fig. 1 - Proposal of a conceptual model
Source: prepared by the author

The proposed of a conceptual model is composed of intellectual capital (IC), structural capital (CE), relational capital (CR), national wealth (RN) and the components of competitiveness (innovation and sophistication) which are tested with the aim of analyzing the moderating effect on the components of intellectual capital and the hypotheses presented throughout the study.

4. Database and Research methodology

The sample is composed of 210 observations and 21 countries. Annual data are used for the 21 European economies during the period from 2007 to 2016, constituting a balanced panel and resulting in the variables. National wealth (RN), will be represented by the growth percentage of per-capita annual GDP(pib), extracted from the global development indicators of the World Bank. Human capital $(CH)$is represented by the human capital index (HCI) prepared by the PENN institute. Structural capital (CE), is represented by the logarithm of the ratio of total patents to GDP$(lnpat)$. Relational capital (CR), is represented by the percentage of foreign direct investment in relation to GDP$(infdi)$.

In order to analyze the influence of intellectual capital and its components on national wealth, during the study period, it is necessary to take into account the period of fiscal austerity of the countries analyzed. To do so, dummy variables are used to analyze separately the austerity period implemented in 2011 and 2012$(aust)$.

The first model to be tested, represented by equation 1, is used to analyze hypotheses 1, 1a, 1b and 1c.
$RN_{it} = \alpha + \beta_1 CH_{it} + \beta_2 CE_{it} + \beta_3 CR_{it} + aust + \varepsilon_{it}$ (1)

The competitiveness of nations is represented by the factors of innovation and sophistication (IS) obtained by the WEF (Schwab, 2016). In order to verify whether they have a moderating effect on the relationship between intellectual capital and national wealth (H2), the following equation will be analyzed: $IS\ RN_{it} = \alpha + IS(\beta_1 CH_{it} + \beta_2 CE_{it} + \beta_3 CR_{it}) + aust + \varepsilon_{it}$ (2)

It is necessary first to analyze whether they IShave a moderating effect on the relationship between human capital and national wealth (H2a), which is the second model to be tested, equation:

$RN_{it} = \alpha + \beta_1 ISCH_{it} + \beta_2 CE_{it} + \beta_3 CR_{it} + aust + \varepsilon_{it}$ (3)

Next, it is necessary to analyze whether IS have a moderating effect on the relationship between structural capital and national wealth (H2b). $RN_{it} = \alpha + \beta_1 CH_{it} + \beta_2 ISCE_{it} + \beta_3 CR_{it} + aust + \varepsilon_{it}$ (4)

To evaluate the fourth model, which seeks to answer whether the factors of innovation and sophistication have a moderating effect on the relationship between relational capital and national wealth (H2c), equation 5 is used: $RN_{it} = \alpha + \beta_1 CH_{it} + \beta_2 CE_{it} + \beta_3 ISCR_{it} + aust + \varepsilon_{it}$ (5)

By conducting the econometric tests in the four models, it will be possible to validate the hypotheses raised and to answer whether intellectual capital positively influences national wealth (H1) and whether the factors of innovation and sophistication have a moderating effect on the relationship between intellectual capital and national wealth (H2).

The methodology used will be the panel data technique, where the estimates by Ordinary Least Squares (OLS) for panel data with fixed effect, random effect and dynamic panel are presented.

According to Hill et al. (1999), estimates of fixed effects panel data seek to control the effects of omitted variables that vary between individuals and remain constant over time. Additionally, the fixed effects model assumes that the intercept is a fixed and unknown parameter that captures the differences between the individuals in the sample. In other words, the model's inferences are only for the observations that contain available data (Duarte et al., 2007).

The dynamic panel model is based on the methodology of Arellano and Bond (1991) and consists of analyzing the first differences of the original models, with the aim of eliminating fixed effects, making it possible to extract the inconsistencies of the model to be analyzed. The coefficients are estimated by the Generalized Moments Method, and the problem of endogeneity is treated with techniques of instrumental variables that recursively include all past values of the endogenous variables of the model. In using the explanatory variable with its lags, it is possible to reduce the problem of the endogeneity of the variables (Wooldridge, 2005).

A crucial assumption for the validity of the dynamic panel data model by the GMM method is that the instruments are exogenous. In the Sargan test for overidentification if the model is correctly identified, detection of invalid instruments is impossible. But if the model is overidentified, a test statistic for the joint validity of the momentum conditions (identification constraints) shows that the model is not correctly identified. Thus, the Wald test can validate this hypothesis (Roodman, 2006)

5. Results and discussion

The variables are analyzed using the econometric technique of panel data to first verify the influence of the intellectual capital and its components on national wealth (model 1), and tests of ordinary least squares (OLS), panel with fixed effects, random effects and dynamic panels are carried out, using equation (1).

The results of the regressions show that when considering an OLS model, human capital, relational capital and the austerity period had a significant influence on the relationship with national wealth. The fixed-effect panel model showed evidence of influence on relational capital and austerity. By analyzing the random effects model, one can see that the variables representing human capital, relational capital and austerity show significant influence. The result of the dynamic panel model demonstrates significant influence of human capital and relational capital. In all models, austerity shows a negative influence on the relationship between intellectual capital and national wealth.

This positive influence of human capital on the random and dynamic models is also verified in the works of Stam and Andriessen (2009), who analyzed the European Union between 1995 and 2007, in the

analysis of the intellectual capital of 10 Arab countries by Bontis (2004), where human capital has an explanation power of 20% of national wealth, in the research of 148 developing countries conducted by Seleim and Bontis (2013), in the work done by Uziene (2014) analyzing 28 Baltic countries, as well as the Schwab report (2016), which indicates the importance of human capital in supporting structural change and increasing competitiveness. On the other hand, as verified in the estimation using panel with fixed effects, Andriessen and Stam (2004) also found no significant relationship between per-capita GDP and investment in human capital.

In analyzing the influence of structural capital on national wealth, the results showed that in no model was found to be significant, despite the positive signs, which is not corroborated by the work of Andriessen and Stam (2004), which, in the analysis of the intellectual capital of the European Union Between 1999 and 2001, found a significant correlation between GDP and investments in structural capital. This was also shown by the research of Ruiz *et al*. (2011) analyzing 82 countries, found that structural capital represented 96.6% of intellectual capital, while human capital represented only 3.4%.

Relational capital was shown to have a positive and significant relationship with national wealth in all the estimates, which confirms the results previously found by Bontis (2004) and Weziak (2007), indicating that relational capital promotes an increase in the economy, which can be expressed by the ability to attract foreign direct investment, as well as by Seleim and Bontis (2013), whose results showed that – in the 148 countries analyzed – investment in relational capital brings benefits to economic performance.

When we consider the period of fiscal austerity in the set of countries analyzed, all models suggest that austerity has a negative effect on the relationship between intellectual capital and national wealth, which confirms the austerity theory, in which Leschke et al (2015) cite that, in the same period, some economies went into major recession, leading to the fall of economic performance. The dynamic panel data model, despite showing the negative sign, showed no statistical significance.

To verify the effect of the factors of innovation and sophistication on intellectual capital and the wealth of countries, the tests for equations 2, 3, 4 and 5 are performed. The correlation matrix shows that the variable $ISCH$ does not present significant correlation with the model's other variables. When considering the moderating effect of innovation and sophistication factors on the relationship between human capital and national wealth, it can be seen that in OLS models with fixed and dynamic effects, human capital impacted by the effect of factors of innovation and sophistication has significant influence on the relationship with national wealth. On the other hand, the correlation matrix shows that the variable $ISCE$ does not exhibit significant correlation with the model's other variables.

It can be seen that, in considering the moderating effect of the factors of innovation and sophistication on the relationship between structural capital and national wealth, there is no statistical significance for any of the models except for the dynamic panel model. The variable that represents the moderating effect of the factors of innovation and sophistication on the relationship between relational capital and national wealth ($ISCR$) does not present a significant correlation with the model's other variables.

In the analysis of the results of the tests for the moderating effect of the factors of innovation and sophistication in the relationship between relational capital and national wealth, it is possible to verify that there is a positive and significant relationship when analyzing the OLS model, fixed effects model, and random effects model.

After the analysis of the correlations and estimates of the variables, the model validation tests are presented. The Breusch-Pagan test and the White test show heteroscedasticity of the data in all of the models analyzed; to make the models more suitable for testing, it was decided to carry out the White's robust correction to eliminate this effect.

The Hausman test for fixed and random effects suggests the use of the random effects model for models 1, 3 and 4. On the other hand, for Model 2, the test suggests that the most appropriate estimation is with the use of fixed effect panel data.

The Wald test for panel data with random and dynamic effects for models 1 and 2 suggests that the instruments used are not adequately specified. For models 3 and 4, the probability values were higher, indicating that the estimation using instrumental variables would be the most adjusted model for analysis. The result of the Sargan test for overidentification shows that the data models in dynamic panel do not present exogeneity in the data, suggesting the validity of the instruments used.

The table below presents the hypotheses raised based on the theory presented, the expected signs for each set of hypotheses, and the signs obtained in the tests performed.

Literature	Assumption	Expected Signals	Signs Obtained			
			OLS	E.F.	E.A.	Din.
Seleim and Bontis (2013); Ruiz *et al.* (2011); Wezniak (2007); Lin Edvinsson (2008); Phusavat, *et al.* (2012)	*H1*	+	n.s.	n.s.	n.s.	n.s.
Andriessen and Stam (2004); Bontis (2004), Seleim and Bontis (2013); Uziene (2014); Schwab (2016)	*H1a*	+	+	n.s.	+	+
Andriessen and Stam (2004); Ruiz *et al.* (2011)	*H1b*	+	n.s.	n.s.	n.s.	n.s.
Bontis (2004); Weziak (2007); Seleim and Bontis (2013)	*H1c*	+	+	+	+	+
n.a.	*H2*	+	n.s.	n.s.	n.s.	n.s.
n.a.	*H2a*	+	+	+	n.s.	+
n.a.	*H2b*	+	n.s.	n.s.	n.s.	n.s.
n.a.	*H2c*	+	+	+	+	n.s.

Table 1 - Summary of expected results and obtained results
Source: prepared by the author
n.s.: no statistical significance at 1%, 5% or 10%

The results of the estimated econometric models allow us to arrive at the conclusion of the hypotheses raised during the study. Thus, to verify whether intellectual capital positively influences national wealth (H1), it is first necessary to answer hypotheses 1a, 1b and 1c. In other words, whether human capital, structural capital, and relational capital positively influence national wealth. The results of econometric tests showed that there is no consensus among models about the influence of human capital on national wealth; however, there is no consensus among models that structural capital does not show statistically significant evidence of influence on national wealth. On the other hand, relational capital was positive and significant in all the estimates made. Accordingly, although we found evidence of the influence of relational capital on national wealth, we cannot conclude that intellectual capital positively influences national wealth.

In seeking to analyze whether the factors of innovation and sophistication have a moderating effect on the relationship between intellectual capital and national wealth (H2), we must follow the same methodology and analyze whether the factors of innovation and sophistication affect the relationship between human capital and national wealth (H2a), structural capital and national wealth (H2b), and relational capital and national wealth (H2c). The results obtained show that the factors of innovation

and sophistication have a positive moderating effect on the relationship between human capital and national wealth, except for estimation by random effects. In analyzing the moderating effect on the relationship between structural capital and national wealth, we can see strong evidence that there is no significant relationship, except when estimating with dynamic panels. In the analysis of the moderating effect on the relationship of relational capital to national wealth, the results show evidence of a positive effect on the estimates, except for the dynamic panel estimation. Thus, despite evidence of a positive moderating effect between innovation and sophistication and the relationship of human and relational capital to national wealth, we cannot assume that there is a moderating effect on the relationship between intellectual capital and national wealth.

6. Conclusion

With the increased discussions on the new perspective of the view of the wealth and growth of nations, there is a need to understand the new types of existing capital, growth based on knowledge and intangible assets, and their importance for national growth and competitiveness.

The primary objective of this study was to analyze the influence of intellectual capital and its components on the national wealth of European Union countries and the moderating effect of competitiveness on the relationship between intellectual capital and national wealth, from 2007 to 2016. The specific objectives were to present the main models of intellectual capital at the national level, the main metrics for measuring the competitiveness of nations, the development of a new conceptual model proposal that seeks to show national wealth more clearly, and to carry out the econometric analysis of all components using the panel data methodology.

The data presented provide information to understand the effects of intellectual capital and competitiveness on national wealth. Hence, data analysis allowed us to identify the main components of intellectual capital and its influence on national wealth; aside from understanding the effect of competitiveness, through the factors of innovation and sophistication, on this relationship, and through an extensive survey of national intellectual capital models. With the proposal of a new model that shows the effect of the factors of innovation and sophistication, it is possible to contribute to the literature on the topics addressed. It is noteworthy that the results achieved are in line with a large part of the studies on the subject, i.e., as countries evolve, the importance of intellectual, human, structural and relational capital becomes increasingly significant.

In terms of limitations, it is important to emphasize that the initial idea was to analyze the influence of intellectual capital on the national wealth of a larger group of countries and for a longer period of time. However, due to the difficulty in obtaining consistent and reliable data, it was decided to restrict the research to a smaller number of countries and a shorter time, in order to guarantee greater reliability to the study.

Future research could incorporate other factors of competitiveness, obtain data on competitiveness according to the IMD methodology and verify the effects of government, business and infrastructure efficiency, according to the methodology. Another suggestion would be to modify the scale used in this research and to analyze whether intellectual capital positively influences regional wealth, possibly subdivided by Classification of Territorial Units – NUTS

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The role of human intellectual capital in business transformation

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Introduction

With the digital economy development, intellectual resources are becoming increasingly important for businesses. And while earlier they were mainly associated with the image of the company, well-established business processes, and knowledge bases, more and more attention is paid today to implicit knowledge, the intellectual capabilities and abilities inseparable from the person. The synergy of joint intellectual activity allows increasing the overall efficiency of the use of human intellectual capital in the organization. As the share of intellectual tasks in the activities of the organization will increase, there will be a higher demand for the ability to manage human intellectual capital. This article presents a model of the human intellectual capital dynamics, which assesses the impact of various factors as a result of business transformation.

Intellectual Capital Classification

Even though since Thomas A. Stewart (Stewart, 1997) and Annie Brooking (Brooking, 1997) the concept of intellectual capital has been widely used in research and practice, the ratio of human and intellectual capital (IC) is treated differently. Most often, human capital is considered to be part of IC, along with the organizational and market capital. However, such a division is meaningful only if all employees of the organization are engaged in intellectual activity. In order to avoid confusing the concepts of human capital and human resources, it is advisable to implement the concept of human intellectual capital by including only the employees engaged in the intellectual activities related to the company transformation, as it was done by Loseva O.V. (Loseva, 2016). However, in Loseva's work, products of intellectual and innovative activity (IID) are also referred to the human intellectual capital, which is controversial, since such products formally do not differ, for example, from business process descriptions in the company, which are also the result of innovation. In addition, it is advisable to classify intellectual capital so that it would correspond to the division of knowledge into explicit and tacit (Alavi & Leidner, 2001). There are numerous studies on the relationship between intellectual capital and innovation (Buenechea-Elberdin, 2017), (Allameh, 2018), (Soo, et al., 2017). However, it is advisable to investigate, which and how parts of intellectual capital are involved in the process of innovation. This requires a deeper structuring of the intellectual capital.

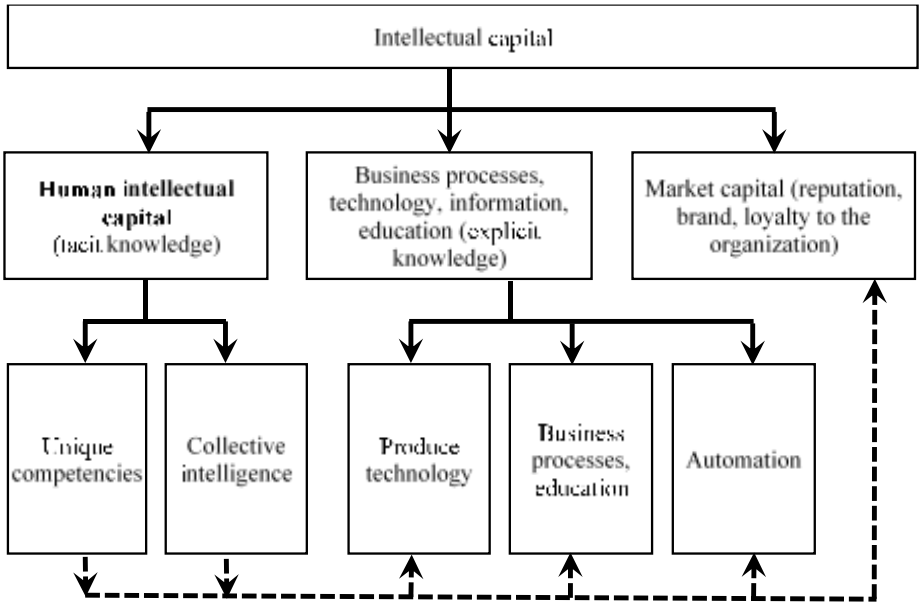

Fig. 1. Place of human intellectual capital in the overall structure of intellectual capital

Figure 1 shows the scheme of intellectual capital, which consists of implicit knowledge or human intellectual capital, explicit knowledge of the company (business processes, technologies, etc.), and market capital (the "image" of the organization from the outside, its reputation, brand, trust of customers and partners). Explicit knowledge in the company, in turn, can be divided into three groups. The first group includes unique production and management technologies (know-how) that determine the productivity and quality of products or services provided. The second group is related to business processes in the organization, routines (Friesl & Larty, 2013), and training. Finally, the third group involves systems and tools of automated management, the implementation of which also defines a certain level of explicit knowledge in the organization. It is easy to see that in this classification, it is human intellectual capital that creates explicit knowledge in the organization, as well as forms the image and market capital of the enterprise. It is human intellectual capital that leads to the transformation of the company and growth of intellectual capital in general. This allows us to formulate the definition of human intellectual capital as the employees' activities that transform the organization.

Mathematical Model

The proposed classification of intellectual capital (IC) allows building a simple mathematical model: All human resources of the company are divided into four groups. The first group includes the employees engaged in the production of goods and services that are provided by the company. Let the share of such employees, expressed, for example, in the share of their wages in the total amount of wages of all employees, be designated as P (Produce). The second group of employees, designated as S (Service), includes the service employees in the company (control, economic support, marketing, etc.). The third group of employees—I (Information)—includes those associated with the information support of the company (accounting in the information system, call center, etc.). In the last group of employees, whose share is designated as T (Transformation), we included all employees engaged in intellectual activity: the development of new production technologies, building business processes of the organization, automation of the company, i.e. all those who form the intellectual capital of the company.

The division into the above-mentioned groups allows simulating a change in the share of employees. The last group of employees responsible for the company's transformation reduces the number of employees in the first three groups. This is either due to the introduction of new technologies in the production, or to the improvement of business processes in the service area, or to the introduction of automation systems. This effect is shown in Figure 2.

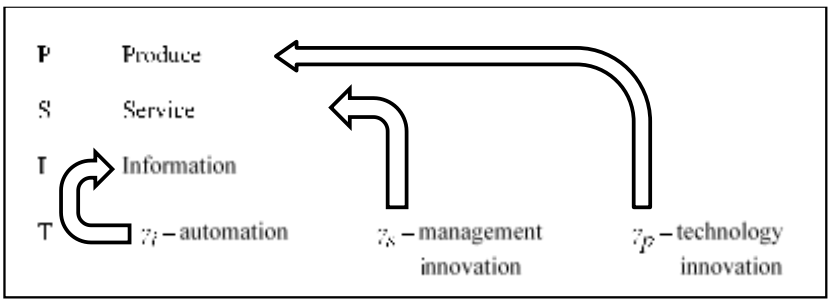

Fig 2. The influence of employees involved in the transformation of the company on the staff structure.

Let the transformation rate values for each of the groups be the constants γ_p, γ_s, γ_i. Then, the equations of the model can be written as follows:

$$\frac{d}{dt}P = -\gamma_p T \cdot P \quad (1)$$

$$\frac{d}{dt}S = -\gamma_s T \cdot S + \gamma_p T \cdot P \quad (2)$$

$$\frac{d}{dt}I = -\gamma_i T \cdot I + \gamma_s T \cdot S \quad (3)$$

$$P + S + I + T = 1 \quad (4)$$

The system of equations (1)–(4) is nonlinear and describes the change in the employee shares. The system of the first three equations can be integrated if we enter the effective time τ, which is associated with the time in the ratio $d\tau = Tdt$:

$$\frac{d}{d\tau}P = -\gamma_p \cdot P \quad (1a)$$

$$\frac{d}{d\tau}S = -\gamma_s \cdot S + \gamma_p \cdot P \quad (2a)$$

$$\frac{d}{d\tau}I = -\gamma_i \cdot I + \gamma_s \cdot S \quad (3a)$$

The solution of these equations will be as follows:

$$P = P_0 \cdot e^{-\gamma_p \tau} \quad (1b)$$

$$S = \frac{\gamma_p \cdot P_0}{\gamma_s - \gamma_p} \cdot e^{-\gamma_p \tau} + \left(S_0 - \frac{\gamma_p \cdot P_0}{\gamma_s - \gamma_p}\right) \cdot e^{-\gamma_s \tau} \quad (2b)$$

$$I = \frac{\gamma_s \gamma_p \cdot P_0}{(\gamma_i - \gamma_p)(\gamma_s - \gamma_p)} \cdot e^{-\gamma_p \tau} + \frac{\gamma_s}{(\gamma_i - \gamma_s)}\left(S_0 - \frac{\gamma_p \cdot P_0}{\gamma_s - \gamma_p}\right) \cdot e^{-\gamma_s \tau} + \left[I_0 - \frac{\gamma_s \gamma_p \cdot P_0}{(\gamma_i - \gamma_p)(\gamma_s - \gamma_p)} - \frac{\gamma_s}{(\gamma_i - \gamma_s)}\left(S_0 - \frac{\gamma_p \cdot P_0}{\gamma_s - \gamma_p}\right)\right] \cdot e^{-\gamma_i \tau} \quad (3b)$$

Here, values of P_0, S_0 and I_0 are the initial values of shares. As a result, the system of equations (1)–(4) can be reduced to the solution of the following nonlinear equation:

$$\frac{d\tau}{dt} = 1 - P(\tau) - S(\tau) - I(\tau) \quad (5)$$

Results of the Model and Discussion

Figure 3 shows the distribution of the employee group shares over time. The share of employees engaged in the production is constantly decreasing. The number of employees involved in the service is growing at first and then reducing. The number of employees engaged in the information support has a similar but delayed pattern. The number of employees engaged in the organization transformation is permanently growing. The number of production personnel reduces because of the productivity growth. However, a more complex work requires a maintenance. Therefore, the personnel released from production is moved to service, resulting in an increase in the size of this group, but after a certain time the population of this group begins to decline, too, due to the optimization of business processes and computerization. A similar situation occurs with the personnel engaged in the information support: due to the introduction of new automation tools, the number of personnel equipped with computers increases, but then begins to reduce due to intelligent algorithms that replace human labor.

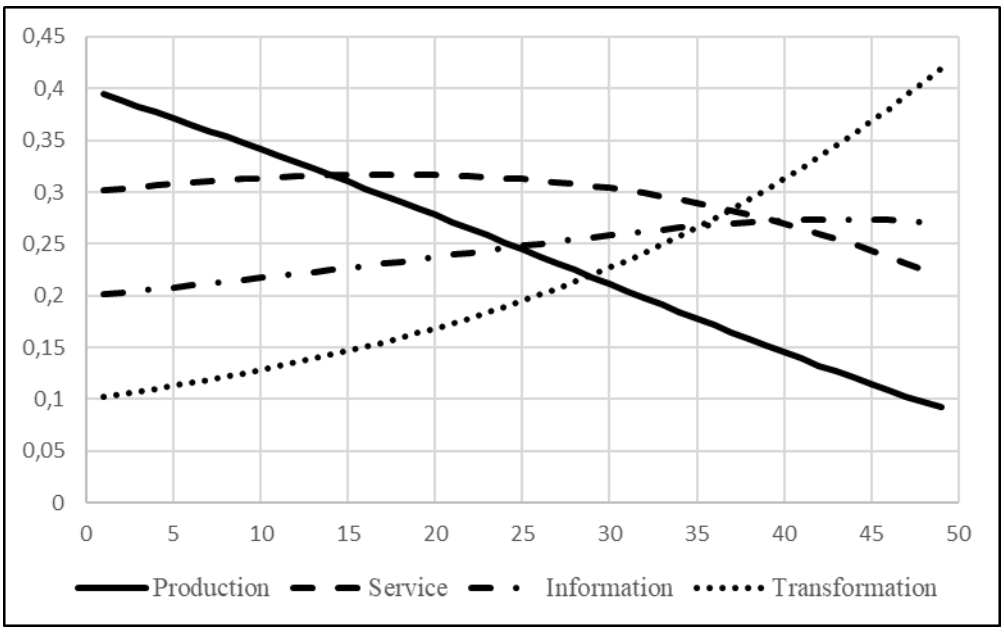

Fig. 3. Changing shares of employee groups over time

It is interesting to compare the dynamics of changes in the number of employees in the company and the change in the global value added by groups of industries—see Figure 4, taken from the study (Slavin, 2015). The first group combines the industries associated with commodity production, including the manufacturing industry, mining, agriculture, etc. The second group combines industries related to the provision of enterprises from the first group of industries, including trade, transport, and energy. The third group includes industries related to the information production (finance, telecommunications, media). Finally, the last group includes all sectors related to humans and knowledge: science, education, technology services, social and health care. The values for the US economies are taken from the website of the Bureau of Economic Analysis of the Department of Commerce (http://www.bea.gov). It is easy to see that the behavior of the groups of industries in Figure 4 and the employee groups in Figure 3 are very similar. This suggests that human intellectual capital is the driver of economic development.

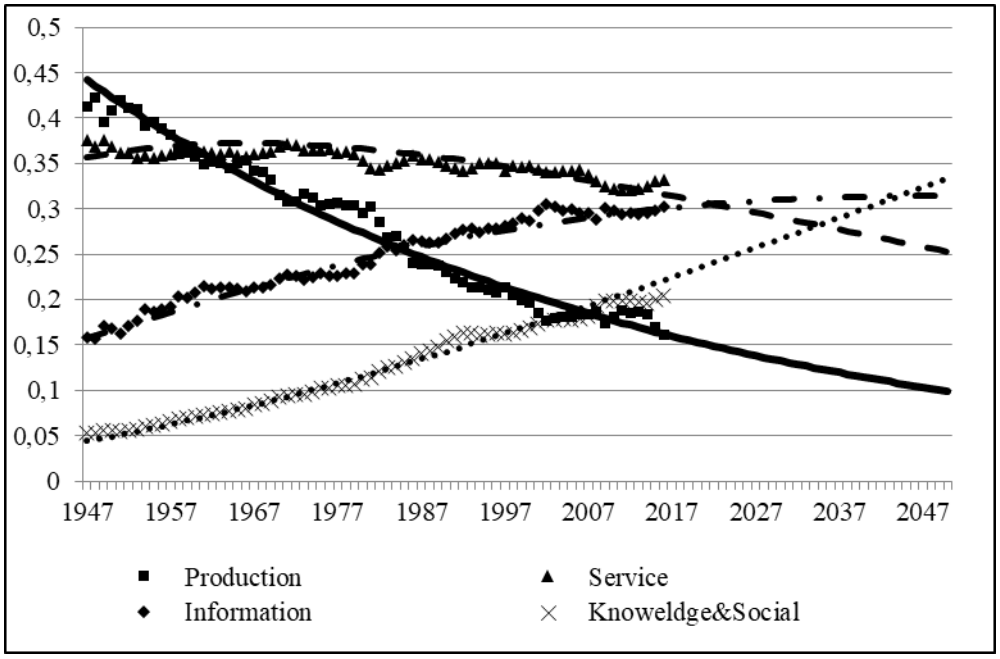

Fig.4 Changes of the value added by groups of industries in the USA

This model shows that it is the human component of the intellectual capital that determines the transformation of the company. However, this component does not include all the employees, but only those who introduce new technologies, improve business processes, and automate the operation of the enterprise.

Conclusion

The study shows that the intellectual capital dynamics can describe the processes of business transformation in an organization. An increase in the number of employees responsible for the transformation causes a reduction in the size of other groups of employees. It is possible that business transformation will be hampered by factors such as reduced innovation opportunities. In this case, the growth described in the model will be significantly lower. The proposed model can also be improved by taking into account the factor associated with the use of the Collective Intelligence Technology (Slavin, 2018), which is becoming increasingly important in the field of innovation. The presented interrelation of the dynamics of changes in the shares of the personnel number in an organization and branches of national economy shows that transformation processes take place simultaneously at all levels.

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Emotional intelligence: A Mechanism for Achieving Sustainable Societies

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Introduction: The History of SAPANA

SAPANA, which means 'Dream' in Nepolise, was founded in 2012, by Carolina Almeida Cruz (founder), Patrícia Assis, Mafalda Mendes de Almeida and Miguel Jerónimo (co-founders), with the aim of empowering individuals to become self-sustainable. Ms Cruz was inspired to establish the organisation after working with local communities in Nepal. Becoming familiar with the limitations that people experience as a result of issues such as poverty or poor education, Ms Cruz sought to promote human dignity and empower the individual as a solution to those barriers and assist them to improve their basic conditions through the leveraging of their personal abilities. SAPANA believes that individuals can achieve self-fulfillment and optimisation of self once they have learnt to become self-aware. As such, for the last seven years, through its numerous projects, SAPANA has assisted individuals through the stimulation of self-awareness and teaching emotional-intelligence, whilst also strengthening private companies and organisations to overcome internal, market and community challenges in a sustained and innovative way. It was through this work that SAPANA developed its methodology of empowerment which can be applied to both groups and individuals, irrespective of their personal, social or economic situations, increasing their ability to access social and economic spheres that they might otherwise be excluded from.

The Traditional Sustainability Approach

Sustainability, or sustainable development, has been commonly defined as "economic and social development that meets the needs of the current generation without undermining the ability of future generations to meet their own needs" (WCED, 1987). On that basis, it is pertinent, when considering sustainability, that the future is considered when making decisions about the present.

This definition brought together what is now known as the three pillars of sustainable development: economic development, social development and ecological development, under one societal goal of sustainability. Fig. 1 shows a common diagrammatic representation of how these three pillars link together to meet the goal of sustainability.

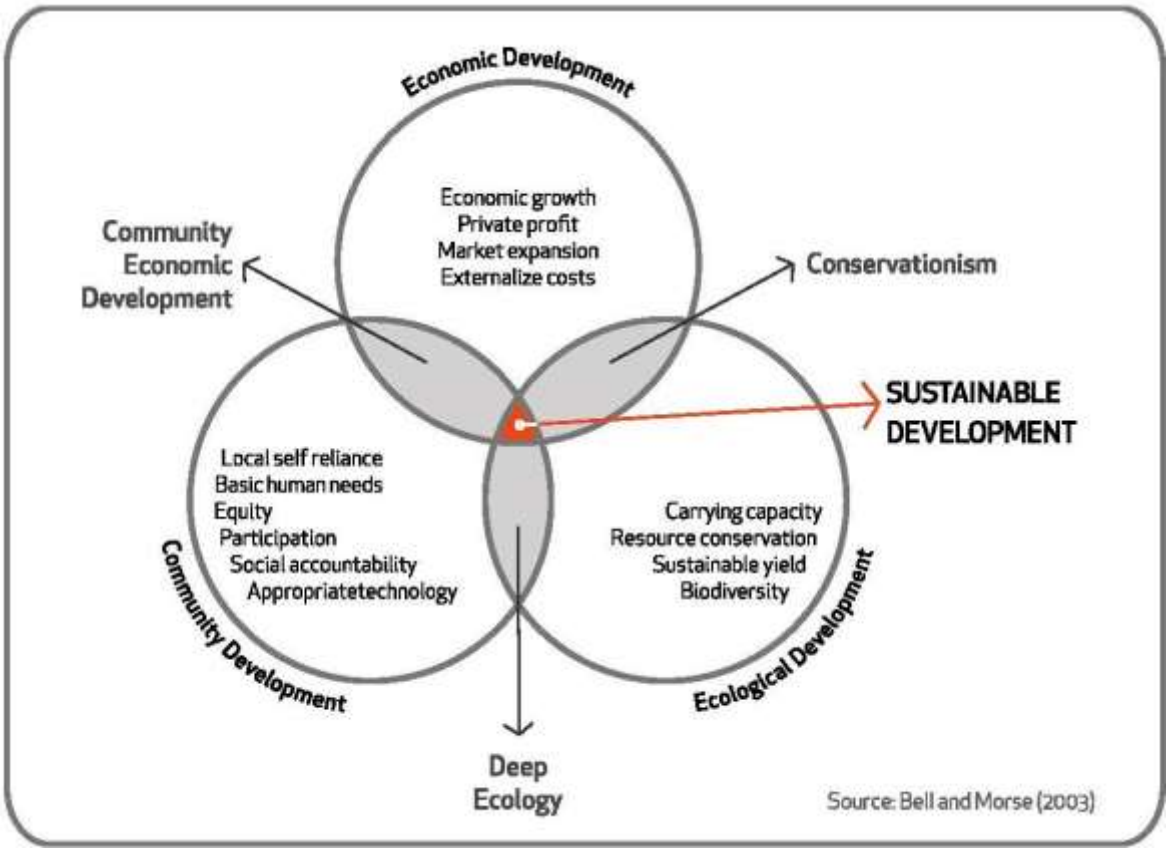


Fig. 1 - The interactions between ecological, economic and social (community) development.

These three pillars were identified in 2005 by the World Summit on Social Development. They have subsequently been adopted in many national standards and certification schemes, and form the backbone of solutions that seek to tackle the core areas of concern that the world currently faces.

A. Economic Development

The concept of economic development proves to be the most problematic of the three pillars as there is broad and nuanced political and economic disagreement on what constitutes and creates sustainable, positive economic development. A further difficulty is presented in providing incentives for businesses and organisations to adhere to sustainability guidelines beyond those which are legislated for, particularly in those instances that they might suffer financially as a result. This is also the case for incentivizing the average person and though an individual's impact may be limited, the effects of many individuals taking action can have a significant cumulative effect. The current economic model of most liberal democracies is consumerist in nature and modern life requires the consumption of considerable resources on a quotidian basis. This then has an impact upon the achievability of environmental sustainability; it is pertinent for that pillar that sustainable economic development includes a reduction in consumption of environmentally damaging products. Economic development is about giving people what they want without compromising on their quality of life, especially in the developing world, and reducing the financial burden and "red tape" of doing the right thing.

B. Social Development

There are many facets to this pillar; most important of which is the awareness of public health and the establishment of regulatory and legislative measures to protect people from public health concerns such as pollution and the potentially harmful activities of businesses and other organisations. In North America, Europe and the much of the developed world, there are strong checks and programs of legislation in place to ensure that people's health and wellbeing are robustly protected. Furthermore, it is imperative to maintain access to basic resources without compromising on the quality of life people experience.

Of particular focus currently is sustainable housing and how to build homes from more sustainable materials. Finally, social development is also concerned with education; encouraging people to participate in environmental sustainability and teaching them about the effects of environmental protection as well as warning of the dangers if we cannot achieve our goals.

C. Environmental Protection

The steps that societies must take to protect the environment are well known; whether it is through recycling, reducing power consumption or walking rather than driving short distances. Businesses are regulated to reduce their carbon emissions and environmentally harmful pollutants. Environmental protection is the third pillar yet presents the most immediate and existential concern for the future of humanity. The concept of environmental protection defines how societies should study to understand and learn to protect ecosystems, air quality, sustainability of resources and reducing stresses imposed on the environment by growing populations.

It also concerns how technology will drive our greener future; the EPA (US Environmental Protection Agency) recognized that developing technology and biotechnology was key to this sustainability, and protecting the environment of the future from potential damage that technological advances could potentially bring.

The Maslow Pyramid

Abraham Maslow's hierarchy of need - or the Maslow pyramid - was first presented in the 1943 in the paper A Theory of Human Motivation. The pyramid establishes a hierarchical division of need in which each level must be satisfied to reach the next. Each level indicates a need that the individual must meet, the individual must 'climbs' the hierarchy until they achieve self-fulfilment.

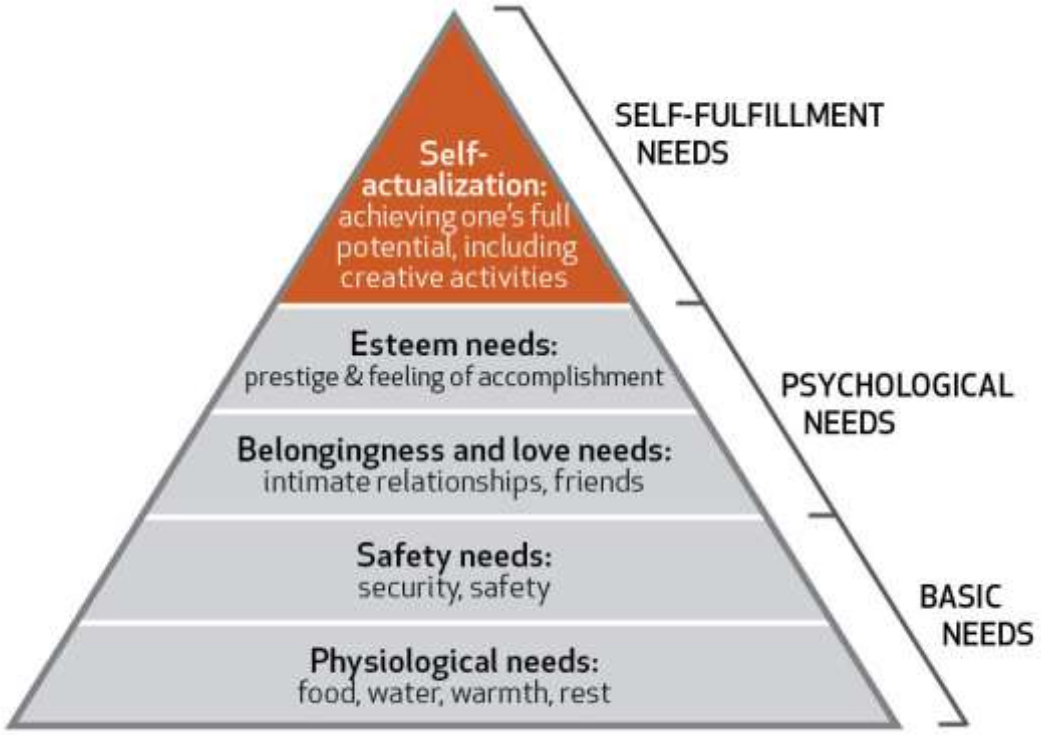


Fig. 2 – Maslow´s Pyramid

Maslow defines a set of five requirements described in the pyramid:

1) Physiological needs (basic), such as hunger, thirst, sleep, sex, excretion, shelter;
2) Safety needs, ranging from simple necessity to feel safe inside a house the more elaborate forms of security as a steady job, a health plan or a life insurance policy;
3) Social needs of love, affection, affection and feelings such as belonging to a group or joining a club;
4) Esteem needs, which include two aspects, the recognition of our personal capacities and recognition of others with regard to our ability to adapt to the roles we play;
5) Self-actualization needs in the individual seeks to become what it can be.

The Skills of Tomorrow

The inclusion of automation and artificial intelligence (AI) in various sectors of the economy is transforming the labour market. Many of the jobs existing today will cease to exist in the coming years and several new ones will arise. Therefore, in the context of changing labour market needs, it is essential that people adapt by acquiring new skills.

Establishing a systematic approach to labour market needs, the World Economic Forum organized the core work-related skills as: abilities (cognitive and physical abilities), basic skills (content skills and process skills) and cross-functional skills (social skills, system skills, complex problem-solving skills, resource management skills and technical skills).

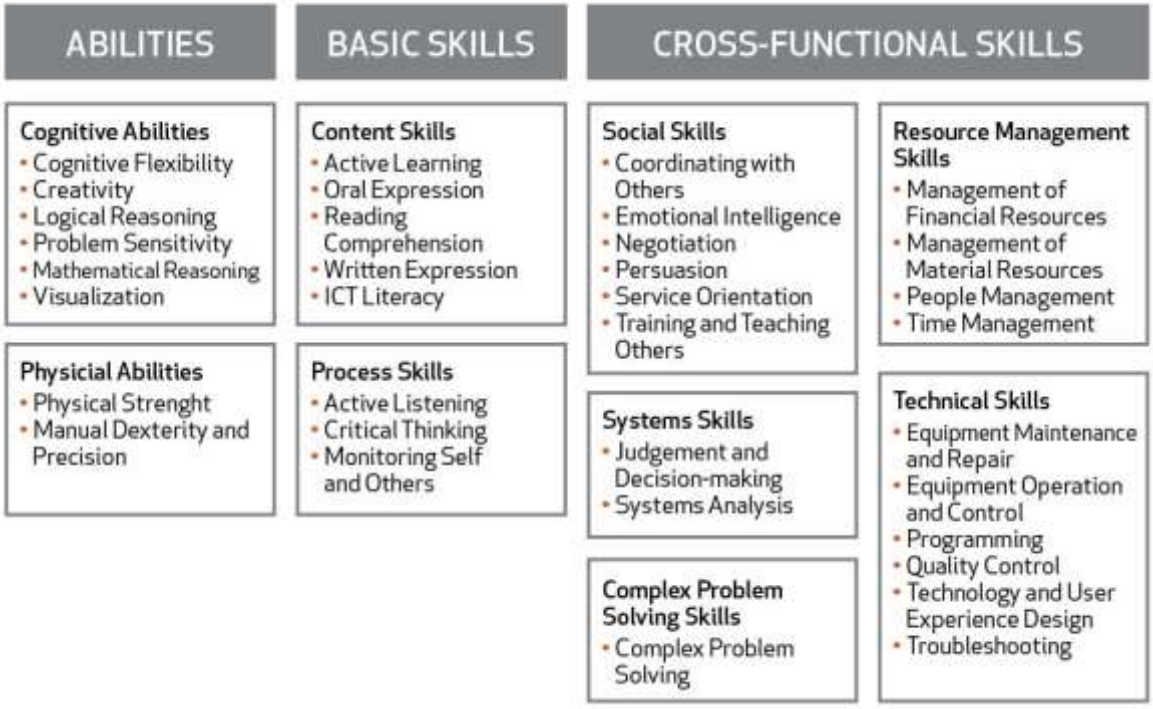
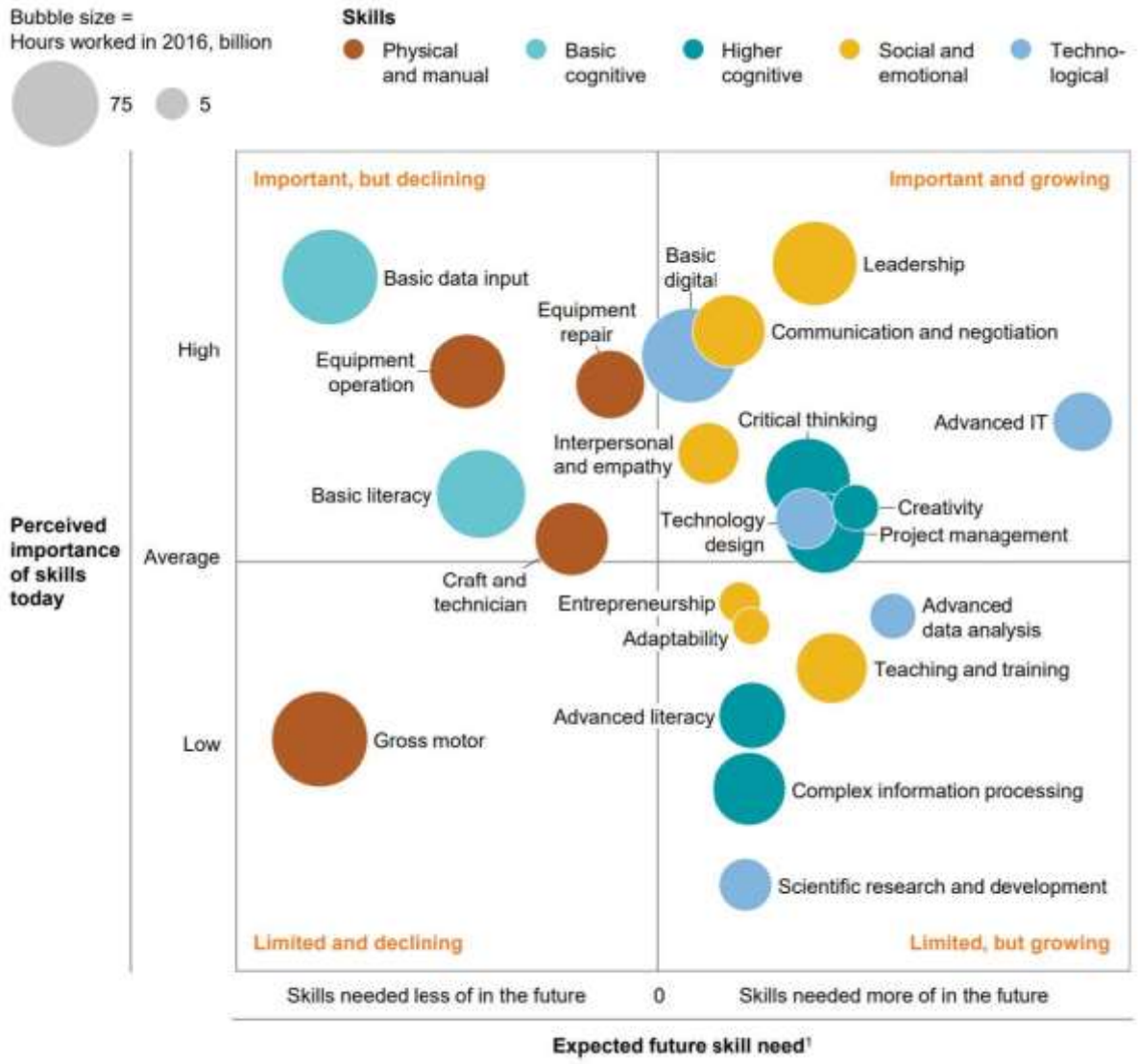


Fig. 3 – Core Work-related skills. (Source: The Future of Jobs, World Economic Forum)

Furthermore, a recent study from McKinsey, Skill Shift: Automation and the Future of the Workforce, shows individual skills based on their perceived importance today and whether employers expect to need more or less of those skills in the future. Overall, employers expect to need more of the social and emotional, higher cognitive, and technological skills in the future, and less of the basic cognitive and physical and manual skills.



1 Difference between % of survey respondents that expect to need a skill more and % of survey respondents that expect to need it less.
NOTE: Based on results of March 2018 survey of 3,031 business leaders in Canada, France, Germany, Italy, Spain, the United Kingdom, and the United States. Chart based on % of survey respondents. Skills descriptions were shortened. Chart does not include fine motor skills, inspecting and monitoring, and quantitative and statistical skills. Bubble sizes are based on number of hours worked.

Fig. 4 - Skills of today vs skills of tomorrow: technological, social and emotional skills will become even more important. Based on McKinsey Global Institute workforce skills executive survey, March 2018

Four specific groups of skills stand out. Those in the upper-right quadrant are perceived as very important today and needed even more in the future. They include leadership, advanced communication, advanced IT and programming, and critical-thinking skills. In the lower-right quadrant are skills that are ranked as less important today but growing strongly in the future: advanced data analysis, complex information processing, adaptability—as well as teaching and training.

Thus, it is possible to conclude that social and emotional skills (soft skills) will be fundamental in the future labour market.

SAPANA's Conceptual Foundations

Before presenting SAPANA's methodology in greater detail, it is first pertinent to define the key conspects upon which that methodology relies, and which will be referred to throughout:

- Waste: lack of use. In this paper, waste relates to the waste of skills. That is, not taking advantage of skills, some of them innate to the individual, to be better and do better. This waste of skills is associated with a lack of knowledge of these skills.
- Competencies: originates from the Latin word competentĭa. The ability to do something successfully or efficiently. Competencies are also defined as "underlying characteristics of the person that led to or caused effective or superior performance" (Boyatzis, 1982). Competencies, also referred to as skills, can be categorized as both soft and hard skills. However, for the purposes of SAPANA's methodology, competencies will only pertain to soft skills, this includes: interpersonal skills, social skills, communication skills, character or personally traits, social intelligence and emotional intelligence. These act in a complementary manner in relation to hard skills. Hard skills, or technical skills, were traditionally considered the most important skills for career development, in that they are quantifiable and therefore more tangible. However, in recent years, many studies have focused on softs skills as the major differentiator for employability.
- Self-awareness: having a clear perception of one's personality: including strengths, weaknesses, thoughts, beliefs, motivation, and emotions. Self-awareness allows the individual to understand other people, how they are perceived by other people and their attitudes and responses to others.
- Sustainability: comes from the Latin sustentare, which means "to sustain", "to support" and "to keep". The ability to sustain / maintain. Sustainability or sustainable development has been commonly defined as "Economic and Social Development that meets the needs of the current generation without undermining the ability of future generations to meet their own needs" (WCED, 1987).
- Emotional intelligence (EI): was first mentioned by Peter Salovey and John Mayer in 1990, who define emotional intelligence as "the ability to recognize, understand, utilize, and regulate emotions effectively in everyday life" (Yale Centre for Emotional Intelligence, 2013). Daniel Goleman, in his 1995 work entitled Emotional Intelligence, showed the importance of EI in relation to children's social and emotional development. He advocated that skills weren't genetic but instead learned and therefore improved. Subsequently, a considerable body of work, including that by people such as Travis Bradberry, Lynda Jiwen Song and Delphine Nelis, has focused on and explored the use of EI; establishing complementary approaches to those by Goleman. Though there have been nuances to the definitions of EI, most include the following characteristics: the ability for one to monitor their own emotions as well as the emotions of others, distinguish between and label different emotions correctly, and use emotional information to guide one's thinking, behavior and ability to influence others (Goleman, 1995; Mayer & Salovey, 1990).

SAPANA's Approach: Individual Sustainability

SAPANA was founded in 2012 with the objective of empowering individuals to fulfil their potential and become the best version of themselves. This fulfilment of potential is possible when the individual is conscious of who they are, their skills, talents, limitation, their beliefs and prejudices, their points of improvement and importantly, where they want to go. To this end, SAPANA developed the iPath methodology and applied it to a range of individuals in a variety of social and economic contexts, including; people in unemployment, suffering social exclusion, undergoing incarceration in prison and company employees.

Since its conception seven years ago, SAPANA has empowered over one thousand people. In doing so, it became evident that irrespective of which of the contexts listed above an individual came from, by developing greater self-awareness, building their self-esteem and establishing their self-motivation, their behaviors changed in a way that increased their individual sustainability. These behaviors positively impacted them in areas such as finding employment, changing to an employment long aspired for, fulfilling personal ambitions, as well as setting and achieving goals more generally.

A deficiency in self-awareness limits the individual's ability to partake in and engage with society, whilst wasting skills and talents, impacting not only their own happiness and well-being but also the development of their social and economic circles. As such, an individual lacking self-awareness is less likely to attain need fulfilment or maximise their potential; on the contrary, that person experiences a waste of skills and of potential.

The SAPANA Approach: Identifying Skills Waste

When society considers the concept of waste, it most often pertains to the physical waste materials produced by an individual or organisation. For instance, the United Nations Statistics Division defines waste as materials that are not prime products (products produced for the market) but material for which the generator no longer has use in terms of their own purpose of production, transformation or consumption and therefore wish to dispose of (UN Stats Division, n.d).

Furthermore, waste generally falls into one of the following categories; solid, liquid, and gaseous, and are classified as created by the following sources; urban, industrial, commercial and agricultural (Biology Discussion, n.d). Such waste may be produced in a variety of ways; including the extraction of raw materials, the processing of raw materials into intermediate and final products and the consumption of final products (UN Stats Division, n.d).

Thus, the concept of waste that is predominant is that of left-over physical material that is no longer needed by the producer or the consumer. When discussing the three pillars of sustainability, it is this concept of waste that is most often considered, as it is a primary cause of environmental damage and therefore a detriment to environmental sustainability.

There are of course other concepts of waste that are somewhat more abstract; the notions of wasting time and energy, be that emotional, psychological, intellectual or physical. In those cases, waste is not an unwanted residual object, but rather the sense that a particular asset, for example time or energy, were misdirected in part or in full, so that the utilising of that asset did not produce the desired outcome. In this regard, the concept of waste pertains to notions of utility and productiveness.

It is also possible that an individual could waste their assets not through misuse or misdirection, but through non-use. An individual's personal capital, that is, their skills, competencies, knowledge and experience, may be under used or not used at all. This concept SAPANA classify as the waste of human potential. Perhaps an analogous example could be that of a raw mineral such as iron or gold. In its raw state, these minerals exist beneath the surface of the earth and whilst they have the potential for value, have none in that condition. Those minerals must be located, extracted, processed and developed before they can be transformed into products of value. This is also the case with human potential. Each individual has the ability or potential for particular skills and competencies, but they must identify, develop and meld before they can provide value.

SAPANA contend that this concept is not only useful as a general method of self-improvement, but particularly pertinent for securing the sustainable happiness of the individual, through sustainable need

of fulfilment, as discussed in relation to Maslow's pyramid. Furthermore, it has significant utility in ensuring the optimisation of human capital within the changing economic models of the 21st century.

The global economy is on the cusp of its fourth industrial revolution. As with the previous three industrial revolutions, new skills come into demand whilst others become extinct (Swan, 2016). Almost 65% of the jobs that Generation Z will be performing don't exist yet whilst up to 45% of activities employees are currently paid to perform are likely to become automated (Swan, 2016). In this environment adaptability and the capacity for learning new skills will be paramount. Therefore, constant self-actualisation and life- long learning will be pivotal to ensure the sustainability and stability of individual need fulfilment in the face of drastic economic change. Utilising emotional intelligence and self-awareness, maximising an individual's competencies and minimising the human potential waste will be necessities in this context. SAPANA's work in Portugal offers a model for achieving this in four stages:

1) Identifying individual competencies: These could be a person's innate or natural skills. This process begins with self-analysis and is optimized through effective self-awareness. It is the process through which an individual identifies their personality traits, strengthens and talents.

2) Identifying market need: Each economy has a set of skills and competencies that it needs from its workers in order to sustain itself and for which it is willing to pay. One such example is the growing need for digital and technological skills as modern global economies become increasingly automated and digitised.

3) Identifying profitable competencies: The skills and competencies that a market most needs but has least access to are those that are most profitable. This is the basic economic notion of supply and demand as applied to a person's skill set.

4) Identifying individual competencies that are lacking: Once the individual is aware of the skill set, they have and the skills that the market needs and is willing to pay for, they are able to ascertain where there are gaps in their own skills. The individual is then able to undertake learning and training to make up for any deficiency of skill they may have.

In conducting the above process, SAPANA advocate doing so on the basis of a continuous improvement cycle as delineated in the Lean Method (Eric Ries, 2011). Through a four-stage process (above) the Lean Method is a model for eliminating waste and maximising value creation. By applying that model to the process outlined above, greater efficiency can be attained, thus gaining greater impact for the individual.

SAPANA's Approach: Methodology

SAPANA's methodology has been developed to provide the greatest possible empowerment of the individual to support them in becoming the best version of themselves. That is achieved by deconstructing beliefs and prejudices, identifying and optimizing skills and talents whilst identifying strategies to improve on weaknesses.

The methodology, called iPath, was inspired by the twelve steps process of detoxification and rehabilitation used by Alcoholics Anonymous (Bill Wilson, 1939) and other addiction recovery organisations. SAPANA uses five steps, influenced by Goleman's Emotion Intelligence (Daniel Goleman, 1995), and adapts the best management tools for use of the individual, in line with psychological and coaching tools.

In completing the iPath programme, an individual should be able to answer the questions: "Who am I?" "Where do I want to go?" "How will I do it?" and "Why?"

To achieve this goal, SAPANA works with individuals in a group setting, encouraging them in the first instance to try and mirror one another, to understand what other members of the group are feeling and have felt. This approach builds empathy and understanding and builds social cohesion through the recognition of shared experiences. This process allows the individual to view themselves throw the mirror of the other person, an early step towards self-awareness.

This group work goes through several steps, each evoking in the individual their primary emotions (Seven Emotions) (António Damásio, 2000), including those that they may not feel comfortable with, so that it is possible to ascertain which were necessary and which needed intervention (Seven Sins and their Antidotes)(William Shakespeare, n.d). It is necessary, in an integrative way, to put the person to work as a person, "Being in the other". That is why SAPANA has developed all of its methodology with the goal of developing in each individual increased capacity empathy - "within emotion", "together with the emotion". By analysing the behaviors of each individual at different times, it is possible to understand the basic needs that they must address.

Basic human needs are core to the human emotional system and to human well-being. Motivation from this perspective, according to Grawe, can be seen as the conscious and unconscious drive to fulfil our basic needs, that is, to feel a little bit more valued tomorrow (self-esteem); to have a bit more freedom or control over the world (control); to understand the world a bit better (orientation); to have slightly better and closer relationships (attachment); and to have more pleasure (pleasure) – SCOAP (Andy Habermacher, Argang Ghadiri & Theo Peters, 2014; Ghadiri, Habermacher, Peters. 2012; Klaus Grawe, 2005.).

The management tool McKsinsey 7S (Ethan M. Rasiel, 1999), can be utilised to create a structured action plan for a specific purpose of the individual or to identify potential external/internal threats, as well as potential forces. It allows the individual to analyze their current situation and to outline the different steps to achieve the goal. In addition to this tool, other management tools can be used, such as SWOT, SMART, SPQ, PEST, Golden Circle.

SAPANA´s methodology as applied to inmates of correctional and penal facilities has been published in a United Nations paper on the same topic (UNECE, 2018). Furthermore, SAPANA's business model and structure were recognized in 2014 by Muhammad Yunnus as an example of social business.

The 12 Steps:

1. AS-IS Analysis (UNO PER UNO): Awareness of the Self. Some of the questions that arise: What are my needs? What is my goal with these sessions? Who am I? What have I done so far? Where am I and why? Am I happy?

2. Self-Regulation (UNO PER UNO): Self-analysis of the Self. Some of the questions that arise: What do I see when I look in the mirror? Why do I feel certain emotions? Why do I think that? Identification of my beliefs.

3. Identify the Purpose (UNO PER UNO): Where do I want to go? What moves me? What have I done to get there?

4. Dreams (ONE PER ONE): What is(are) my dream(s)? What have I done for it/them? Deconstruction of beliefs and Perceiving beliefs.

5. Fears (UNO PER UNO): What are my fears? Why? Fear vs love.

6. My talents (UNO PER UNO): What are my strengths? What do I like to do most?

7. The Self in society (UNO PER ALTRE): What is my impact? Why do I do it? What people do I impact?

8. Self-Reconstruction (UNO PER ALTRE): What should I do to improve? What are my goals?

9. Targets/Goals: Prioritize goals; Choose the first goal to work; SWOT analysis; SPQ Process and Golden Circle.

10. Goal resolution: Using the RPM method.

11. Evaluate and Measure: Define metrics for achieving the goal and evaluate whether the goal has been met.

12. Follow-Up: What are the next steps?

The 7 Emotions:

By facilitating a situation in which an individual's primary emotions are evoked, causing feelings which they usually don't feel comfortable with, it is possible to perceive what is necessary and where there should be intervention. It is also possible to identify primary emotions that an individual is feeling through their behavior and attitude, either through expression or 'covering up' of those emotions.

- Primary Emotions: For Ballone, primary emotions are innate and are linked to instinct; that is, to survival. There is a concomitant generalized contraction of the flexor muscles, being possible to adopt a regressive foetal attitude, peripheral vasoconstriction, paleness and cooling of the extremities, with a very brief stop of respiratory movements and heart beats (2005). These emotions are as follows: Fear, Anger, Sorrow and Joy.

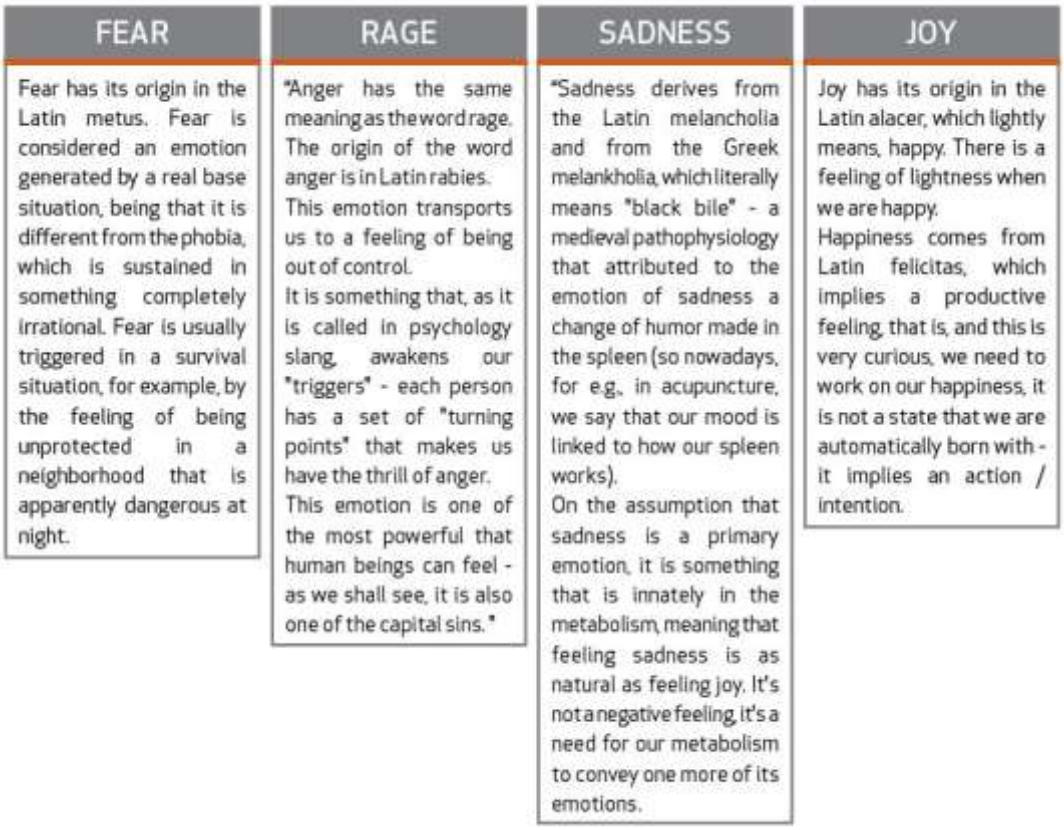


Fig 5. Primary Emotions

- Secondary Emotions: Secondary emotions are those that, upon reaching the amygdala and producing an emotion, suffer the influence and possible dominance of the cerebral cortex, changing its primary nature. This way, emotions become responses or avoidance (intellectualized) to primary emotions (2005) "Abreu.

  These emotions are as follows: Jealousy, Envy and Shame.

JEALOUSLY	ENVY	SHAME
"Jealousy is a natural feeling of the human being produced by the lack of exclusivity of the feeling, the dedication and the care of the person of whom we like. It comes from the Latin, ZELUSUS, ZELUS," zeal, emulation", from the Greek ZELOS; sometimes "jealousy", but often with the sense of "emulation, invalidity". We may feel jealous of every human being, as long as he has a high level of consideration on our scale of importance.	"Envy is the desire to possess an object / good that belongs to the other. It is a feeling of inferiority and sadness at the happiness of the other. It is a feeling of greed for wealth, brightness, and the prosperity of others - we'll take a closer look at this concept when we'll explain the "Envy" sin. For the Catholic Church, envy is one of the seven deadly sins and the virtue of charity and love thy neighbor are preached against it. When will it be that the human being is envious of something? When there is a need, an emptiness, the shadow effect, when there is something we want to have and we do not have. We can, of course, interpret envy as a desire to have someone, something that regardless of its form, we will want, wish for, dream about. It comes from the Latin Invidia, initially interpreted as "looking down to, cast an evil eye -" IN "and" look "at VEDERE.	It comes from the Latin verucúndia. It implies an action against decorum, the structure of others. It has as an external expression the feeling of displeasure that promotes in us the idea or the fear of dishonor. Shame, contrary to the primary emotions, "is acquired", is gained as something "external" to us. Children are hardly ashamed when they are born, but when they begin to interact, shame is one of the first feelings that arise, such as the shame of our parents, for example, or who we consider as references.

Fig 6. Secondary Emotions

The 7 Sins and their Antidotes

Sin is traditionally defined as a transgression of a law or religious, ethical, or moral principle. Mortal sin is the sin that causes the Divine grace to be lost and leads to the condemnation of the believer, if it is not an object of confession (admission of guilt) and genuine repentance and penance (retreat before God). Everyone has the potential to make mistakes; and we all make a lot of mistakes. On the other hand, the human being has to capacity to realize the "mistake" they have committed, and therefore they can also realize which "antidote" they will have to develop to ameliorate it. If we were to analyze ourselves, we will notice that we have all committed these seven sins at some point in our lives. These are parts that SAPANA consider almost as instinctive as the 7 emotions already described.

SINS		ANTIDOTES	
LUST	The desire for status, recognition, power, food for fame - lust is one of the sins that people with more access to power can feel.	CHASTITY	Chastity is the ability of each of us to castrate our impulses to control our inconsequential wills.
GLUTTONY	It is often represented in cartoons in the form of obese magnates. Gluttony is excess of indulgence, excess consumption of anything to the point of waste. It can be interpreted as selfishness, essentially a constant concern for the interests of the self - Staring at our own navel "- we would venture to say even that this expression is born very much of the way in which, unconsciously, we are totally egoic.	MODERATION	Absorbing knowledge, or whatever kind of matter, should be absorbed with temperament, evenly.
GREED	This sin is totally focused on material goods. Greed is the sin symbolized by Eddie Vedder's music, "Society". Its assuming our validation through material goods, of what we have: car, house, material status, tangible goods.	CHARITY, GENEROSITY	The person's ability to be generous with something that is his is the demonstration that the other is more than his own.
LAZINESS, IDLENESS	"Laziness implies unwillingness, the non action of doing something. Notice if" the good ones do nothing in life, the bad ones will win. "There is even an expression that is depression without happiness / joy. There is a blockage of spiritual evolution, leading to an extreme. It's those people who give up "because", such as, for example, getting married because yes. It is to believe that nothing of what I, as being, would do, is useful. Being that the focus is on the absence of pathos - quality that excites the emotion."	DILIGENCE	In a company, how can we motivate those who feel lazy, who has the action of doing nothing? That is why when we mention that one of the variables that the HR evaluate, is assiduity and conscience, they are the antidotes to those who are lazy.

SINS		ANTIDOTES	
ANGER	"It is one of the sins that we better understand. All of us, when we are triggered by triggering feelings, have the ability to feel this feeling of being angry." It is a state that puts us into out-of-control states. Is an extreme of self-destruction. It places us in different stages of gravity: A) impatience, B) suicide, and finally C) addition. Notice that people who are addicted to narcotics are naturally "aggressive."	PATIENCE	In the Buddhist religion it is said that one of the secrets of long life is the ability to be patient. When thinking about this Buddhist truth, we find that it has a very interesting foundation, and that, for example, if we are visual and observant, we notice that when we feel anger, our facial wrinkles deepen, become more visible - aging is visually correlated with wrinkles.
ENVY	"Envy, already described in the seven emotions, focuses on what the other has, on what he has achieved, and leads us to want the other to have nothing.	GOODNESS	"The ability to be happy with the happiness of others, is a great act of caring, maturity, kindness. In professional terms, for example, promoting people who are in a inferior position to ours, and enabling this employee to access more knowledge, with a genuine intention that the apprentice surpasses the master, is one of the best ways to perceive a leader who delegates or the one who "kicks."
PRIDE	"It is considered to be the most important sin, and in Catholic history it was the sin that gave its name to the Devil." Lucifer. It feeds itself entirely on the energy and wisdom of others. He truly believes that he is better than the others, feeling a great vanity. See's himself as God, stands on a pedestal of the unattainable.	HUMILITY	As a popular expression says, "A Human Being loses everything when he loses his humility." "This Portuguese saying shows in a simple way what pride can provoke - it is self-destructive."

Fig 7. 'Sins' and 'Antidotes'

STRATEGY	Which goals? Como os vais atingir?
SYSTEMS	What do you do every day to get there?
STRUCTURE	What is the family support/structure? Financal Support? Friends?
SHARED VALUES	What is your purpose in life? Are your values aligned with the goal? Mission / Vision
STYLE	What's your personality?
SKILLS	What are your skills? Given your goal, do you have any missing skills? What are your talents? What sets you apart?
STAFF	What should you work to achieve your goal? Which skills are missing? Need some external support?

Fig 8. Mckinsey's theory as applied to the individual

SCOAP

Klaus Grawe was one of the first in the field of psychotherapy to truly connect neuroscience to therapy in order to consolidate therapy with the science of the brain.

Klaus Grawe reported that humans have a limited number of broad basic needs and proposed four: self-esteem, orientation and control, attachment and pleasure. Epstein observed that these four emotional needs were always present in human beings and their fulfilment or violation would lead to an increase or decrease in human well-being.

In SCOAP those four needs were expanded to five needs: the need of 'Control and Orientation' are seen as two separate needs. Control is the action: freedom and autonomy and influence, or self-efficacy in short. Orientation, on the other hand, is how an individual understands and builds a picture of the world or a 'conception of reality'.

SELF-ESTEEM	is the feeling of self-worth and value. This has been considered a key need by a long, long list of authors and researchers. This is also, ironically, probably the hardest to research at a biological level as the concept of self-esteem is so all encompassing. Nevertheless recent research has investigated neural representation of selfesteem (Eisenberger et al., 2011) and more specifically, for example, that social rejection activates pain centres in the brain (Eisenberger & Lieberman, 2004; Kross et al., 2011).
CONTROL	feeling of freedom and autonomy and the ability to control the world around us. Control also depends strongly on orientation and is tightly linked to the adrenaline system in the brain (Grawe, 2007).
ORIENTATION	feeling of understanding and creating a consistent and coherent picture of the world and an individual's position in this either in terms of the world in general or an individual context, such as a business or family. It is clear in mental health that mental illness is often accompanied by distorted orientations of the world and reality.
ATTACHMENT	feelings of bonding to others. This has been well researched since first proposed by Bowlby in the 1950s (Bowlby, Ainsworth & Bretherton, 1992; Bowlby, 1951, 1970). Attachment is first and foremost attachment to primary caregivers but recent research into the neural correlates show how important the oxytocin system is (and other opiates) and how this drives attachment feeling (Young et al., 2001) not to mention the ability to trust. This has also been measured in the field of economic decision making (Baumgartner et al., 2008; Kéri & Kiss, 2011; Kosfeld et al., 2005).
PLEASURE	feeling of reward and positivity. This stretches back to Freud's pleasure principle but it does not take much thought to see that pleasure is a core component of our life either in elation but also in deeper satisfaction and feelings of reward. Indeed the good/bad evaluation stretches across all our senses (for example, the sense of smell and good smells vs. bad smells). Pleasure relates closely to the dopamine system and other opiates (Arias-Carrión et al., 2010; Schultz, 2002; Wise & Rompre, 1989).

Fig 9. Breakdown of Grawe's five needs

SAPANA's Projects

SAPANA has applied, and adapted where necessary, the methodology deliniated above to individuals within the following contexts:

- Unemployed: more than 800 people empowered since 2012. These people are between the ages of 18 and 65, areas of training from the 9th year to higher education and in short- and long-term unemployment situations.

- Inmates: empowered 20 men aged 20 to 50 years old; low levels of education. The work was conducted 6 months after the completion of their sentences.

- Socially excluded young people: empowered more than 30 young people in different neighbourhoods in the Oeiras municipality. These young people were aged between 18 and 30 years and had low levels of education. In these neighbourhoods, there is a kind of general conformism, fostering inertia and lack of perspectives beyond the neighbourhood; there is even disbelief in the system and the surrounding community.

- Young cancer survivors: empowered 16 young people aged 15 to 30 who were unable to attend classes or work due to treatments for a long time. These young people are restarting and adapting to a new context after overcoming the disease.

- People with reduced mobility: empowered 30 people aged 20 to 50 who had a motor impairment. These people are currently searching for a job.

- Employees: empowered more than 200 people from different companies, from different business sectors and from different departments. This empowerment aimed to solve a need identified by the company. The predominant focus revolved around people motivation, improving the working environment and talent retention.

Observations and Results

The outcomes of SAPANA's projects have provided an evidence base through which the impact of self-awareness development upon the individual and the environment that they are part of can be analyzed.

Whilst employability was not a primary outcome that SAPANA sought, one of the consequences of applying its methodology to the individual was in fact increased employability. In the case of unemployed people, the employability success rate of the methodology was above 82%, whilst in the case of socially excluded young people, it was over 60%. In the case of inmates, it is of 50%.2

This is due to the fact that people are more aware of themselves, their skills and goals, leading to a change in, for example, their focus on job searching and behavior whilst conducting a job interview. There was also a marked increase in self-esteem, self-confidence and self-motivation.

The awareness of oneself leads to the individual questioning themselves more frequently and to increased self-reflection; this in turn leads to a constant development of self-knowledge. This "new" individual then has an impact their primary circle (meso) by questioning people and awakening them to their self- awareness.

The Individual: A New Sustainability Pillar

SAPANA's experience over the past seven years has led to the development of a new approach not only to the pillars for a sustainable development but also to the basic needs defined in the Maslow Pyramid.

The concept of sustainability, as previously mentioned, is associated with the three pillars of sustainable development - economic, social and ecological. Only when these three pillars are united, it is possible to achieve sustainable development. However, as a consequence of the work which SAPANA has developed over the past seven years, they present a new approach by adding another pillar: The Individual.

This new pillar represents the individual as an agent of change and responsible for developing the other three axes. That is, from the moment the individual develops their self-awareness, becoming more aware of themselves and consequently more empathetic with the society and the environment that surrounds them, their behavior will be distinctive and therefore contribute positively to the development of the three other pillars.

SAPANA considers this fourth pillar crucial for sustainable development, as that only with more conscious and empathetic individuals, will it be possible to effectively contribute to the sustainable development of the world. This approach to sustainable development may be conducted on a micro-

scale, for example with the sustainable lifestyle of the individual or, on a macro scale, as with the sustainable development of a company.

SAPANA's Adaptation of the Maslow Pyramid: The Introduction of Self-Awareness

Self-awareness is fundamental to individual development, thus it must be a need pervasive throughout each layer of the Maslow Pyramid, to ensure that the individual can sustainably climb the pyramid and attain the need fulfilment of layer. This addition of self-awareness to the primary needs defined in the Maslow Pyramid, is SAPANA's second approach.

Self-awareness depends on self-reflection that is provided by the people who make up the individual's primary circle, that is, the people who give them love and the people of reference. These are the people who can ask the right questions leading to reflection and self-awareness. But it is also possible to develop self-awareness through intrinsic introspection.

Self-awareness is the first stage in the process of a person or organization achieving success.

We can extend self-awareness as an evaluation of the actual situation. The evaluation of the actual situation requires the individual to read themselves and read the reality in which they exist. The ability of reading reality, (recognizing emotions, triggers, patterns, limits, beliefs) is driven firstly by an introspection in which individuals focus the attention on themselves.

This action allows oneself to compare, analyze and evaluate one's own behavior, states of mind and emotions. Becoming self-aware gives a clear picture of the stage an individual is at and what needs to be done to read a further stage. When it comes to developing new skills, self-awareness enables the individual to measure and understand the efficacy and capacity of those skills.

Once an individual is fully aware of their level of skill, they will be able to take action towards its improvement in a quick and efficient manner. Self-awareness also provides the ability for the individual to understand their intrinsic talents, strengths, limits, fears, emotions. Combining these traits provides a clearer picture of which actions the individual must take to achieve their desired goals.

Self-regulation is concerned with the individual's ability to manage all the traits found through their self-awareness process. From emotions to inner sources, a high level of self-regulation drives individuals to become more trustworthy, adaptable and innovative.

In order to reach a good level of consistency, it's important to manage efficiently the energy and adaptability of a person to ensure consistency. Awareness of one's triggers and how to handle them, ensures more sustainable and consistent outcomes as decisions and actions are based on structured and analytical thought rather than impulse.

Therefore, SAPANA considers three key questions for the individual:

- Who I was? | Who I want to become?
- What for?
- Reason why?

Conclusion – How this Approach Tackles Sustainability in Society and in the Corportate World

SAPANA's approach to sustainability and methodology have developed through project work, has led the organisation to conclude that by empowering the individual to achieve better self-awareness, it is possible to develop societies and companies in a more sustainable way. For the individual is at the centre

of sustainable development and they are in the main responsible for that development. Once there are more conscious individuals, there will consequently be a more sustainable world in its other three pillars.

In this sense, the individual is an incredibly important agent, and therefore it is fundamental that self-awareness of the individual be a factor of the Maslow pyramid, so that the individual can achieve fulfilment.

SAPANA's experience in the last seven years has provided a strong evidence base to the fact that empowering the individual and developing their self-awareness creates a positive change of behavior. For example, in an unemployment context, they managed to find a job or develop their own business. In the corporate sector, SAPANA see that there is an impact on the work environment. After applying the methodology, the outcome was that people where are happier, more confident and proactive as well as developing internal projects that positively impact society.

Furthermore, there is a contagion effect. That is, the individual themselves is also become more sustainable in their development and ability to achieve personal need fulfilment.

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Turning Knowledge Management, Human development and Sustainability Concepts into Practice - an ERP Project case study

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1. Introduction

The environmental theme has been promoted globally, since the 60s, through international treats, scientific research, formative academic programs and public discussion in general, becoming one of the most important issues of public interest since then (Leal Filho, 1999; Pott and Estrela, 2017). The 17 Sustainable Development Goals (SDG), adopted by all United Nations Member States in 2015, intend to be a global proposal to build a better world for people and for our planet by 2030, bringing the social and environmental issues to be discussed in society (Leal Filho, 2019). Among most SGD, the role of knowledge, learning an innovation is central. It is not surprising that, history shows, knowledge has been an important element in the evolution of science and society. Even the Digital transformation, having grown at the end of the last century and becoming exponential in the 21st century, was also a historical process that influenced several areas of knowledge (OECD, 2000). This paper aims at questioning in what extent knowledge management practices, especially communities of practice (CoP), can contribute to participatory knowledge building. A case study is used in order to broaden this debate and illuminate the challenges involved in knowledge management implementation in a transformative perspective towards social change. It is still important to highlight that, although the terms sustainable development and sustainability are diversely defined and interpreted (Leal Filho, 2000), this paper doesn´t discuss these concept definitions and its dominant ideologies (Soares Junior and Quintella, 2008). On the other hand, it comprehends the environmental issues, in a capitalist society, as social equality, human dignity and environmental justice struggles (Ascerald, 2010).

2. Literature Review

2.1. Knowledge Management (KM)

Knowledge Management may contribute to social participation as well as social and environmental justice progress. Cardoso and Machado (2008) describe the management of knowledge embraces every form of production, storage, distribution and use of knowledge, making necessary the use of information technologies to facilitate the process, due to the great increase in the volume of data. Based on that, the IT and the human resources take a strategic position when debating KM implementation.

Cavalcanti and Gomes (2001) discuss that the traditional economic model has changed incorporating knowledge as an essential factor of economic production, more important than land, labor, capital, and other tangible resources. So in the Age of Knowledge which began at the end of the 20th century, a new and advanced form of capitalism emerged. At this stage, knowledge and ideas are the main source of wealth and therefore economic growth. In addition, new forms of work, business and partnership arise. (Batista, 2016)

These perspectives allow the understanding of Knowledge Management as an interdisciplinary domain which is built up from human and organizational development approaches, cultural approaches, and systemic approaches. In these viewpoints we both combine people and technology focuses. (Bitencourt, 2010) These approaches comprehend challenges, such as: how to get better technical means to get the information and how to put them available to be consumed by anyone in an easier way, as well as how to guarantee individual´s participation. Barroso and Gomes (1999) understand that Knowledge Management is crucial to deal with accelerated world and it allows smart products and services delivery, with integrated solutions, inside a global world. When dealing with sustainability challenges, it may contribute to innovative solutions production based on stakeholder´s diverse contribution in .transnational, national (countries), regional (e.g., states, regions, provinces), local (e.g., municipalities, cities, localities), organizational (e.g., companies, public agencies, universities, nongovernmental organizations), economic sectors (e.g., energy, transports, agriculture), households, communities/families, and individual levels (Ramos, 2019).

Fig 1 - Knowledge Management context. (Source: www.knowledge-management-tools.net)

As shown on the Fig. 1, Knowledge Management is structured based on important topics that, at the right balance, widen its results and impacts. For example, this means that it is useless investing great effort just on technology without having the same effort in policies; strategies; corporate culture; organizational processes; including KM methodologies; and leadership practices. Margilaj, Edlira and Bello (2015) also indicate Critical Success Factors (CSFs) for Knowledge Management implantation based on their experience with Albania organizations. Such factors are: Leadership in management, Culture of organization, Information Technology, a clear and well-planned strategy, a measuring system, and an Organizational structure.

So, it is important to highlight that the combination of these factors may maximize Knowledge Management potential to respond positively to sustainability challenges in terms of innovative solutions creation and implementation; social participation; and public awareness.

This KM potential tend to contribute to sustainability issues as it may be considered as the “process of selectively applying knowledge from previous experiences of decision-making to current and future decision making activities with the express purpose of improving the effectiveness” (Jennex, 2005, p. viii) of organizations, projects, programs, strategies and public policies. Knowledge management focusing on human and institutional development may embrace learning, social participation and knowledge production through a variety of practices and initiatives, most of the times in a complementary form of implementation.

At this moment, we mention some frequently used KM practices: data bases, yellow pages, knowledge audits, subject matter experts, communities of practice, lessons learned, good practices, libraries, Innovation management tools, corporate education programs, Knowledge capture, Storytelling, Information portals, Intranets, Information management; and Content management (Albena, Elissaveta and Roumen, 2008). However, we highlight the community of practice as a very comprehensive tool, coherent and adherent with sustainability challenges. The APQC (2010) defines a community of practice (CoP) as a group of people who act together to share and learn from each other, according to common interest(s) around a specific knowledge domain. They are driven by the intention of sharing and solving problems, experiences, insights, templates, tools best practices and lessons learned. This type of community tends to become the locus of identifying, sharing and creating valuable knowledge. Currently, the community of practice as a knowledge management initiative is being widely used. "However, not all groups that engage in a common theme can be called a community, and not all communities are communities of practice." (Ferreira and Silva, 2014).

To ensure the effectiveness of communities of practice, many studies have been developed identifying best practices to be adopted (AQPC, 2010; Wenger e Snyder, 2000). These surveys indicate that communities of practice need to be: a) legitimized and recognized in the organization, project, program or public policy where it is implemented; b) integrated in the business or issue being -developed; c) supported by appropriate technologies; d) integrated with related initiatives, such as corporate universities; and e) formally sponsored (Wenger and Snyder, 2000). In addition, it is necessary to build communities more than by strengthening existing networks but, above all, building and/or enhancing social participation - a fundamental element to knowledge construction, innovation and social interventions in a democratic way. In fact, however, this study does not neglect some critics made upon KM implementation in the context of changes in the world of work. In this case, it is pointed out that KM practices could be used to expropriate, control and standardize workers' knowledge (Cruz, 2010).

2.2. Social Participation

Considering social and environmental challenges, based on the orientation of government actions and social development as holding the democratic ideal of fulfilling social rights, this paper presents relevant ideas of social participation as some background (BAQUEIRO, 2016). It is important to consider that where social and environmental procedures do not adequately include affected parties in decision-making, particularly those from vulnerable and marginalized sectors of society, social and environmental justice cannot be realized. (SIMPSON and BASTA, 2018; QUINTAS, 2005) Effective social participation in projects, programs, strategies, and public policies is important not only to improve the development and implementation of these initiatives but also to enhance social control. Arnstein (1969) proposed eight levels of citizen participation, including the first (manipulation) and second level (therapy) where there is no participation at all, while from the third through the fifth level stakeholders tend to be informed of issues and their views are sought (fourth and fifth), but they still don´t make decisions. Finally, in the sixth (partnership), seventh (delegated control) and eighth (citizen control) levels, shared decision-making and increasing levels of control are given to the stakeholders. In terms of public policies, social programs and projects, participation of the "governed in their government is, in theory, the cornerstone of democracy". However it is important to highlight that "participation without redistribution of power is an empty and frustrating process for the powerless. It allows the power holders to claim that all sides were considered, but makes it possible for only some of those sides to benefit. It maintains the status quo." (Arnstein, 1969, p. 216). Hanberger (2001) considers that people's participation is the most

important quality of a democracy. The power of the people is built or exercised when they participate. Currently, participation is assumed to foster democratic citizens. Participation is presumed to help create identity, to encourage a desire to participate further in common affairs and to develop responsibility. (Hanberger, 2001). Moreover, it is extremely appropriate to emphasize that social participation in public policies, programs and projects must consider forms and instruments to minimize the conditions of asymmetry of power and technical information among the diversity of social actors, making social participation legitimate and democratic (Ministério de Minas e Energia, 2018).

3. Case Study

3.1. Methodology

This study was elaborated through a bibliographic research and a single case study (YIN, 2001) according to a qualitative research approach. Participant observation and documentary analysis were techniques used to facilitate data study. The case study was a community of practice implemented to support a business project. The community selection occurred based on the following criteria: to include geographic dispersed groups; to be a sustained knowledge management initiative; to be held mostly in the public sector; to be diverse in terms of gender, professional areas and organizational hierarchy positions of its members. One criterion was not fulfilled, however, that was: to support a social project. The community of practice selected supplies a business project in the infrastructure sector.

3.1.1. The case study

Description

The project in progress is an Enterprise Resource Planning (ERP) implementation in ten companies of a business group of the energy sector in Brazil. The project involves professionals distributed in these companies, through the country, among several business areas, including the information technology (IT) area. This project covers more than 300 business processes, which are organized into four macro processes: Finances, Human Resources, Supplies and Engineering, with dedicated teams. Besides these, there is the change management team, called OCM - Organizational Change Management. OCM, as a front line, is responsible for: the communication actions; training; identification and qualification of stakeholders, implementation of motivation and engagement actions; support leaders actions and the management process itself, among other actions linked to the support of the planned change. The community of Practice is anchored on this front line.

The initial context

Considering the necessity of knowledge democratization and team's participation for the ERP project success mentioned, a community of practice was designed and implemented, supported by a social collaborative methodology, organized through a digital platform that permit to engage individuals horizontally.

The community of practice operation

The ERP Community of Practice was created in August, 2017, under the Knowledge Management Program already existing in one of the ten companies that are members of the project. Supported by a robust IT tool to promote collaborative and social learning, this initiative focuses on the knowledge management approach based on people (BITENCOURT, 2010; PMI, 2017). Its main objective is to provide a reference environment for strategic, tactical and operational knowledge produced in the project. With 1007 members in May, 2018; and 1201 in April, 2019; this community of practice has 45 subcommunities (thematic areas within the larger universe of the community), according to the criteria of the work fronts of the project: technology; organizational change management; management; templates and macro processes of the business: finance, human resources, supplies and engineering. The community of practice was structured according to the development needs of the formal phases of the project and the work of the teams.

Most Active Subcommunities of Practice	Number of Downloads
1. ERP Project Execution and monitoring Subcommunity	864
2. Human Resources Virtual classroom	1305
3. General ERP Project Subcommunity	961
4. Subcommunity A	873
5. Finances Subcommunity	503
6. Subcommunity B	52
7. Project Artifacts	586
8. SuppliesVirtual classroom	300
9. Assets management Virtual classroom	202
10. Human Resources Team - Overview	136

Table 1 – Rank of the most active subcommunities of practice and its respective number of downloads

The above indicators, whose data was collected in April, 2019, point the sustainable use of this community. As a reference, it should be noticed that there are 34 communities of practice and 4 knowledge bases in the whole company that hosted the ERP Community of Practice; more than 510 subcommunities of practice - logical groups of knowledge (delimited by theme, process, item of knowledge, etc.) - as parts of existing communities of practice and knowledge bases. One of the indicators used here denotes the 10 most active subcommunities within this universe. The result states that from the 10 most active subcommunities of practice, 8 belong to the Community of Practice analyzed, namely, the ERP project community of practice. Among the 10, the first 3 are part of this initiative (Table 1). Only the subcommunity A and B don´t belong to the ERP Project community of practice. The presented indicator *Number of Downloads* (Table 1) also points out the activity of the studied community of practice, specially highlighting that the knowledge available is used and therefore may be relevant to members' participation.

Data Collection and Analysis

Data collection involved participant observation and documentary analysis in order to answer the question in what extent the community of practice contributed to knowledge building in a horizontal and participative manner. The data analyzed was synthesized in Table 2 and 3.

Critical Success Factors	Leadership in management	Culture of organization	Information Technology	Strategy	Organizational structure	Measuring system
Practices adopted by the ERP Community of Practice	Formal leader and a support team stablished.	Dissemination of the ERP Project CoP by newsletters, events and management meetings	Digital Platform, social collaborative virtual environment	KM Vision concentrated on the community of practice leader, the support team and leaders in general.	Group of KM roles concentrated on the community of practice leader, the support team and leaders in general.	Set of indicators to measure the progress benefits and effectiveness of the ERP Project CoP. These indicators are calculated automatically by the platform. There are ranks that show the most active members.

Table 2 – Critical Success Factors for a Community of Practice Effective Implementation

Part of the data analyzed was to verify if the Community of Practice fulfilled the critical success factors necessary to effective implementation (Table 2). It was very important to check if there was the adequate basis so that the community could reach its goals in terms of knowledge cycle functioning - storage; distribution; use of knowledge; and production. Different colors were used to indicate a disseminated practice (green); a partially disseminated practice (yellow); a barely disseminated practice (red); the lack of some practice (gray). In this case, the community of practice is structured and implemented according to good practices, most of them disseminated through the ERP project.

Knowledge Cycle	Storage	Distribution	Use of Knowledge	Production
Practices adopted by the ERP Community of Practice	Organization of the community contents and activities in subgroups, called subcommunities. Organization of contents into folders in which subcommunity	All contents may be versioned if necessary. The content published may contain tags.	The search tool in the community of practice involves all contents.	The community agenda includes integration activities and knowledge production forums, where events and activities were developed in face-to-face and virtual environment in an associated way.
	All didactic material produced in the ERP Project is available in subcommunities called *Virtual Classes.*	All courses offered during the project used the common didactic available in the CoP.	The blueprints were used by all teams.	Workshops to elaborate gaps between the ERP rollout and the key users needs were held at the beginning of the Project. Workshops are held to monitor the user needs' fulfillment in terms of ERP system functionalities.
	Main artifacts generated by the Project Management Office (PMO) are available.	Strategic and operational documents are available, including schedules, the analytical structure of the project, the team list, risk matrices, action plans to mitigate risks; the communication plan and bi-weekly status reports, and newsletters. Messages are sent to indicate new published materials.	Lessons learned were used from phase one to phase two of the project.	According to Project management practices, lessons learned were elaborated and disseminated through all teams. Interdisciplinary Workshops and Meetings are constantly held to solve problems and find solutions to configuration challenges in the ERP Project.

	Strategic and operational documents are available, including schedules, the analytical structure of the project, the team list, risk matrices, action plans to mitigate risks; the communication plan and bi-weekly status reports, and newsletters.	In the business subcommunities, the mapped processes, both AS-IS and TO-BE, were shared, as well as a descriptive of the process, roles and responsibilities, business rules and specific scenarios of each one of the ten companies. The blueprints were shared before the ERP system configuration.	Templates to register the performance of the ERP system during tests are shared at the CoP and used by teams in monitoring activities.	The book of the project history was elaborated by all teams collectively.
	In the business subcommunities, the mapped processes, both AS-IS and TO-BE, were shared in the BPMN notation (blueprints).	Presentations used in meetings are shared.	Training plans and course catalogues are shared and used to identify courses' participants.	Problem solving occurs in groups as a principle where creative solutions are sought.
	In the general subcommittee of the ERP project, a common area for all its members, documents of general interest of the project are available, such as a glossary of terms adopted in the Project, and a welcome guide, with important pieces of information about the physical space of the Project, location of restaurants, medical stations, emergency exits, among other pieces of information.		Schedules are shared and used to design specific activities. Photographic register are available to motivate and integrate members. There is a monitoring system with indicators showing who is participating and how. It includes publishing contents metrics It is possible to acknowledge people through the KM Platform used	Yellow Pages inside the CoP help members find specialists and interact with them.

Table 3 – Practices adopted by the ERP Cop according to the Knowledge Cycle Phases

The main participatory methodologies used were: meetings; workshops; texts, templates and spreadsheets elaborated collectively; kick off events; presentations and schedules elaborated

collectively; at presence and virtually. At the Platform, the wiki tool and the virtual forums aren't being used yet, what would enhance horizontal participation.

Participant observation indicated that the ERP CoP facilitated knowledge building in a participatory way since: it comprehends all project members; all kinds of information are disseminated on real time for all members; messages and newsletter inform every CoP´s member of new content published and the project´s major advances; each member can comment, suggest, analyze and/or criticize any Project aspect, publishing content publically at the ERP CoP, despite different member´s hierarchical positions. The real time content dissemination, combined with participatory tools and methodologies adopted by the ERP CoP, favored horizontal and participatory knowledge building. It is important to indicate that the ERP Cop operation didn´t eliminate management meetings restricted to Project leaders.

The ERP CoP seems to contribute to knowledge building in a participatory way. It contributes strongly to the democratization of contents, reducing asymmetry of information. Power asymmetry may be reduced by the horizontal knowledge dissemination and building processes adopted.

4. Conclusions and Recommendations

The results of the case study include the identification of relevant benefits brought by a Community of Practice implementation, such as: its members integration in the same way at the same time; the reduction of information asymmetry; knowledge dissemination and building processes facilitated, expanded and expedited; and power asymmetry reduction by the horizontal knowledge dissemination and building processes. Moreover, these benefits are potentialized when social actors are geographically dispersed, since a CoP may favor the participation as a continuous and including process.

Considering an inter-disciplinary approach, democratic leadership, management practices and methodologies are critical success factors in a CoP implementation, considering participatory knowledge building processes; otherwise this KM tool may reproduce social exclusion and subordination patterns. "The kind of democratic culture in which a participatory endeavor is set might influence the motivation and ease of actors to participate" (Cook, Kesby, Fazey and Spray, 2013 apud Fritz and Binder, 2018, p. 11) .

Once such relevant results were found, it is now necessary to carry on other KM case studies, focusing on social initiatives; since the analysis presented on this paper reflects a KM initiative on the business sector. Further investigations must be held analyzing KM implementation and impacts in social public policies, programs and projects, verifying how it can contribute to participatory knowledge building and decision making. Research must be made relating KM implementation with e-Democracy and e-Participation studies. This paper did not intend to critically discuss the limits and potentialities of knowledge management implementation to social and environmental justice realization, what must be an important research to be carried out, considering social change and human development.

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Patent fees policies and international extension of university patents: Evidence from Portugal

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1. Introduction

Universities have been increasingly involved in technology transfer activities, in addition to their classical roles on education and research. Since the 1980 Bayh-Dole act in the U.S., many countries have been developing innovation policies to support entrepreneurial universities as drivers for economic growth. This paradigm shift is well described in foundational literature such as (Baldini et al., 2015, Etzkowitz et al., 2000, Mowery and Sampat, 2004) and in this context, intellectual property rights (IPR), specifically patents, have assumed a central role in universities benchmarking in terms of innovation and in technology transfer from academia to industry.

Although the American universities have been experienced a long period of growth in patenting (Leydesdorff et al., 2016) with a real impact in the economy (AUTM, 2017), the scenario in Europe is different. The discrepancies between the high R&D input and low innovation output observed in Sweden (Bitard et al., 2008), also coined as the European paradox, has shed light on the difficulties regarding dissemination and exploitation of research results. In this sense, European countries have carried out legislative actions and invested in infrastructure for technology transfer at universities, including the training of staff from technology transfer offices (TTOs), and other initiatives and programs to promote patenting (Sellenthin, 2009, Siegel et al., 2007). Universities typically transfer technology by protecting their inventions through patents and then licensing to the industry. Due to the central role of patents in deep-tech sectors such as biotechnology and computer technology, a big effort on technology development and protection has been made by countries aiming at increasing the weight of knowledge-intensive activities in their economy (Powell, et al., 2004).

Recently, with the drafting of the new Framework Program Horizon Europe, the appropriation of innovation returns in State-funded research and innovation, has gained a new focus. Mazzucato (2013) argues for an Entrepreneurial State, where the State as an active market creator and market shaper, rather than being limited to a regulatory and a market failure solving role. Regarding technology transfer from universities to industry, the thought can easily follow that the State should appropriate much more innovation returns from the IPRs it grants.

In comparison to other European countries, Portugal is ranked as a “Moderate Innovator” in the European Innovation Scoreboard 2018. From the official European Patent Office (EPO) and the local Patent Office (Instituto Nacional da Propriedade Industrial - INPI), the country historically ranks in 30th-40th places at the EPO in patent applications, yearly national patent applications amount for one thousand, roughly.

In order to promote technology transfer from university to industry, several governmental initiatives fostering innovation have been launched since 2001. The major innovation public policies ranged from increasing awareness on IPRs, to founding TTOs and to supporting tech-based and tech- enabled entrepreneurship. In this context, two major families of measures may be identified – training- oriented and patent internationalization funding.

The training-oriented initiative started in 2001 with creation of GAPI, a network of Industrial Property Support Offices. The public financial support to GAPI initiative had three editions: the first between 2001

and 2007 with a budget of 17,1 M€ (Osswald et al., 2015), followed by GAPI 2.0 between 2009 and 2011 involving 1,8 M€ (COMPETE, 2012), and finishing with GAPI 3 from 2013 to 2015 funded with 1,0 M€ (COMPETE, 2013). An additional initiative, the Technology and Knowledge Transfer Offices (OTIC) was implemented in 2006, to support the foundation of TTOs at universities and polytechnic institutes (collectively designated as Higher Education Institutions - HEIs). The public financial support to OTIC was 4,6 M€ (MCTES, 2010). Together, GAPI and OTIC were introduced to train staff and empower the use of IPRs by Portuguese HEIs.

Patent fees policies to fund international patent applications were introduced by the Portuguese Government in parallel with the training-oriented initiative. SIUPI (Incentive System for the use of Industrial Property) and LAIP (Patent Internationalization Incentive) were financed by public funds with 1,9 M€ and 0,3 M€, respectively (INPI, 2011), and were tailored to provide direct financial support to international patent applications and their maintenance fees. Moreover, the Portuguese Law 108/88, from 24th September 1988, exempts public institutions, including HEIs, from all domestic patent-related fees i.e. application, notification and maintenance fees. This is consistent with the view of the Entrepreneurial State laid early on - a benefit to public HEIs by fee waiving, in order to promote innovation from the public sector and appropriation of innovation returns by the public sector.

Despite the increasing research on university patenting, the number of studies addressing the use of domestic and international patent applications by HEIs is still scarce. The determinants underlying the international extension of university patents has been focused by several studies in an international comparison (Fisch et al., 2014) or different national contexts such as Belgium (Saragossi and de la Potterie, 2003), Germany (Tinnemann et al., 2010) and Japan (Yamaguchi et al., 2016). While the vast majority of the literature in this area mostly study American universities, it is critical to evaluate the effect of public innovation policies in Europe. The role of public funding on the patent filing and internationalization strategies followed by universities, in the context a moderate innovator country such as Portugal remains poorly studied. It is critical to understand either the governmental initiatives fostering HEIs patenting led to a societal benefit.

To fill this gap, we evaluated the evolution of domestic and international patent applications and grants filed by Portuguese HEIs (with and without joint ownership with companies) between 2001 and 2015. Using this data, we studied the impact of the governmental innovation policies on patent applications by Portuguese HEIs.

This work has two major contributions to the intellectual capital field. First, a detailed characterization of the use of patents by Portuguese HEIs between 2001 and 2015 is provided. Second, the impact of the major innovation public policies on the university patenting was evaluated, comparing the application, granting, internationalization, and commercialization levels of Portuguese HEI-owned patents with other worldwide systems, discussing possible action points.

2. Methodology

2.1. Study framework

The impact of public innovation measures in patent applications by Portuguese HEIs (universities and polytechnic institutes) was evaluated. In order to pursue the question of how Government policies affect patenting strategies of universities the framework presented in Fig. 1 was used to plan this study. In particular, the evolution of both domestic and international patenting by Portuguese universities and polytechnic institutes was assessed looking at the effect of national funding for patent internationalization and patent fee waiving law. In this sense, the patent

portfolios from 29 public Portuguese HEIs were evaluated using a two-stage approach, namely a database study followed by a survey to 26 TTOs with at least one patent application in their portfolio. Data on university patent families' commercialization was obtained from the survey to TTOs.

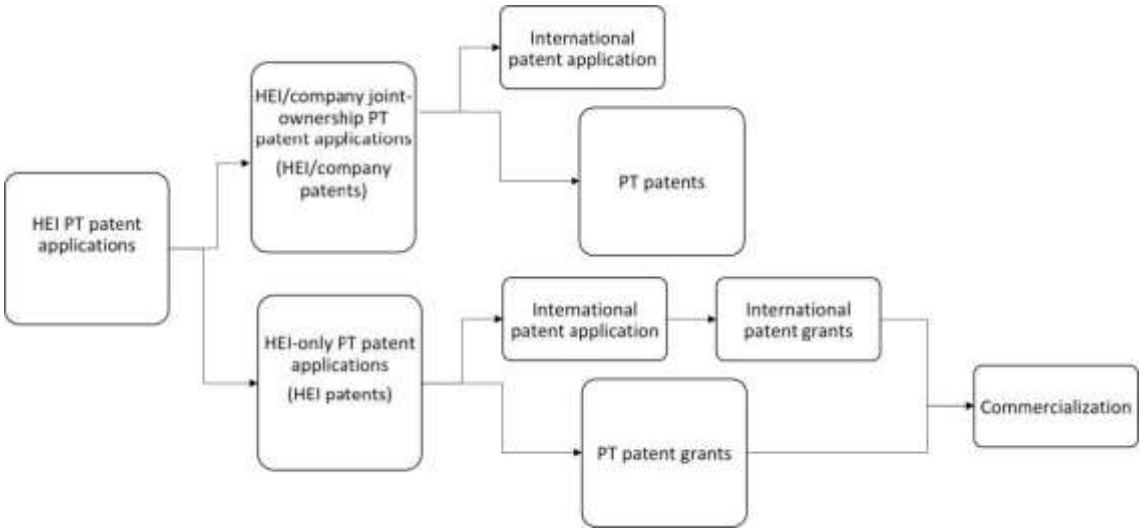

Fig. 1 – Study framework

2.2. Data collection

Patent data was retrieved from the EPO Worldwide Patent Statistical Database (PATSTAT) and cross-checked with the INPI's database. Data was filtered for the Portuguese HEIs-owned patents filed since 1st January 2001, the year of foundation of current TTOs in Portugal. The last filing date included was 30th October 2015. In order to evaluate the patent fee waiving effect, we have considered only the patents that have been applied for at the Portuguese patent office (INPI) by HEIs - therefore, patents with PT priority. As the patent fee waiving for HEIs is only applicable when there isn't joint ownership with private institutions (e.g., companies), we generated two datasets: the first one only included patent applications from Portuguese HEIs without co-ownership with private institutions and with a Portuguese priority date (therefore, not subject to patent fees); the second one included patent applications from Portuguese HEIs with a Portuguese priority date and that had as co-applicant a company (we consider them to be jointly owned patents, and they would be subject to patent fees according to Portuguese law). Patent data was organized and treated at family level. According to the European Patent Office (EPO) a patent family is "a collection of patent applications covering the same or similar technical content. […] related to each other through priority claims." (EPO, 2017). In terms of family size, we considered terms of the number of distinct geographical applications subject to patent examination. Therefore, Patent Cooperation Treaty (PCT) publications were not considered for the family size - only to state if a patent had been internationalized. Utility models were not considered and duplicates were eliminated.

To collect additional information, it was necessary to contact TTOs directly due to the fact that data on patent commercialization/licensing is not publicly available. Thus, TTOs were contacted by email and phone from 1st of May to 30th of June of 2017 and requested to: (i) validate the patent families included in this study according to the criteria previously presented, and (ii) indicate which of the patents included in the study are commercialized. From the 26 TTOs contacted, 18 have collaborated in this study, which allowed us to obtain data on the commercialization status of 90% of the patent families included in this study. Sixteen TTOs delivered detailed information, 2 limited

the information provided to aggregate data due to confidentiality issues, and 8 TTOs did not answer to our survey.

2.3. Statistical analysis

Descriptive statistics were carried out to characterize HEIs patenting. To further evaluate the differences suggested by descriptive statistics, statistical analysis was carried out using SPSS Statistics version 24 (IBM). Statistical significance was considered at $p < 0,05$.

For the HEIs patents, the following variables were analyzed: (1) domestic (PT) applications, (2) domestic (PT) grants, (3) PT patent grant/application ratio, (4) international extension of patent applications, (5) international grants, (6) internationalization ratio, (7) average patent family size, and (8) number of patent families in commercialization. The PT patent grant/application ratio determined in this study is the ratio between PT granted patents in the year n and the number of PT applications in the year n-2, considering an average pendency between the filling and the patent grant of 28 months. Additionally, an internationalization ratio was used, which is the ratio between the number of international applications filled by a HIE in the year n and the number of domestic applications in the year n-1. The internationalization ratio means to measure the international extension of HIE patents, which can occur within 12 months from the filing data of the first patent application.

In order to compare the effect of the patent fee waiver in HEI patent internationalization, we controlled the internationalization of these patent applications with the internationalization of HEI/Company's patent applications. The variables taken into consideration were the internationalization ratio and the family size in the two populations.

Mann Whitney U test was used for comparing the differences in domestic and international patenting, both between HEI and HEI/Company's patents, and in the presence of public innovation policy incentives (GAPI, OTIC, SIUPI, and LAIP). This non-parametric test was used due to the non-normal distribution of the analyzed data.

3. Empirical results

3.1. Portuguese HEIs patent portfolios

Portuguese HEIs filed 852 Portuguese patent applications from 1st January 2001 to 30th October 2015 as a single applicant or in co-ownership with other HEIs (Table 1). From the 29 HEIs, 14 were universities while 15 were polytechnic institutes. Our findings indicate that 74% of the patent filings were done by the top 5 HEIs as applicants, all universities. A similar pattern was observed for number of domestic patent grants, international applications and grants, and the number of commercialized patents. Polytechnic institutes presented low patenting intensity, with exception of the "Instituto Politécnico de Leiria", which was the 6th HEI according to the number of patent applications.

In total, our findings showed that between 2001 and 2015 the Portuguese Universities were granted 60% of their domestic patent applications. International routes were followed in 24% of domestic filings with a patent grant rate of 18%, constituting patent families with an average size of 1,43 patent applications. In terms of commercialization, 13% of Portuguese patents granted to Universities were licensed or are being explored for commercial uses, according to the survey sent to TTOs.

Entity	PT applications	PT grants	International applications	International grants	Average family size	Commercialized patents
Instituto Politécnico de Portalegre	0	0	0	0	-	0
Univ. Madeira	0	0	0	0	-	0
Instituto Superior Politécnico de Viseu	1	0	0	0	1,00	1
Instituto Politécnico de Santarém	2	0	0	0	1,00	NA
Instituto Politécnico de Tomar	2	1	1	0	1,00	0
Instituto Politécnico de Beja	2	1	0	0	1,00	0
Instituto Politécnico de Castelo Branco	2	2	0	0	1,00	0
Instituto Politécnico de Coimbra	3	1	1	0	1,00	NA
Instituto Politécnico de Viana do Castelo	3	0	0	0	1,00	NA
Instituto Politécnico do Cávado e do Ave	3	1	0	0	1,00	NA
Instituto Politécnico do Porto	5	2	1	0	1,00	0
Instituto Politécnico da Guarda	6	0	0	0	1,00	0
Instituto Politécnico de Bragança	6	3	0	0	1,00	NA
Univ. Católica	6	3	3	0	1,33	NA
Univ. Açores	7	5	0	0	1,00	NA
Instituto Politécnico de Lisboa	11	8	2	1	1,09	0
Instituto Politécnico de Setúbal	12	6	2	1	1,08	NA
Univ. Coimbra	15	10	7	1	2,20	2
Univ. Évora	15	14	2	1	1,67	1
Univ. Beira Interior	31	11	2	0	1,03	0
Univ. Trás-os-Montes e Alto Douro	40	19	14	1	1,40	1
Univ. Algarve	47	30	2	1	1,04	1
Instituto Politécnico de Leiria	49	19	7	3	1,18	1
Univ. Nova de Lisboa	50	25	19	6	2,14	8$
Univ. Porto	57	45	32	5	1,61	15
Univ. Minho	116	84	45	10	1,78	28
Univ. Aveiro	122	57	35	1	1,22	4
Univ. Lisboa	284	194	45	9	1,21	6*
Sum	*897*	*541*	*220*	*40*	-----	*68*
Joint HEI ownership correction	*45*	*26*	*13*	*2*	-----	*2*
TOTAL	**852**	**515**	**207**	**38**	-----	**66**

Average (± Standard deviation)	-----	-----	-----	-----	**1,43 (±1,56)**	-----

$ Patents in co-ownership with companies may be included since the TTO did not provided detailed information on licensing., * Number of commercialized patents since 2010, NA = Not answered.

Table 1 – Patent portfolio of Portuguese HEIs with filing date between 1st January 2001 and 30th October 2015.

3.2. The impact of Portuguese innovation policy on domestic university patenting

Several initiatives on IPRs awareness and protection have been carried out in Portugal since 2001, involving both universities and polytechnic institutes. The most relevant initiatives involving financial support and in the framework of public policies were: 1) GAPI (training in IP), 2) OTIC (creation of TTOs at universities), 3) SIUPI (patent filing) and 4) LAIP (patent internationalization). Moreover, the Portuguese law exempts public institutions, including HEIs, from patent-related fees if the applicants are only public institutions. In order to understand the impact of these public policies on the university patenting, we evaluated the evolution of both domestic and international patent filings and grants as outputs of these financial incentives.

Analysing the HEI patents subset (852 patent applications), the number of patent applications and grants filed by universities in Portugal increased in this period. The maximum number of filings occurred in 2008 for both universities and total patent applications filed at INPI (Fig. 2). After 2008, the number of patent filings done by HEIs registered a relatively flat rate of about 50-60 applications/year. Although the evolution of total patent applications and applications filed by universities has been similar, universities reached a new plateau of applications/year after 2008, which constitutes an increase of 150- 200% in comparison to values registered in the period 2001-2004.

Since GAPI and GAPI 2.0 specially addressed the promotion and development of skills in IPRs, the hypothesis that both GAPI initiatives affected the evolution of patent applications filed by HEIs at INPI was tested. GAPI 3 was not included because it was designed to encourage entrepreneurship not necessarily based on IPRs, and the effects on the studied outputs of this recent initiative are difficult to assess. Our results showed that GAPI initiatives, in general, had no effect on total domestic patent applications (p=0,327) although GAPI has been in place in 10 out of the 15 years analyzed. The first edition of GAPI (2001-2007) showed a tendency for a positive effect on the number of patent applications (p=0,064), but it was only significant if this initiative's duration has been limited to 2006 (p=0,013). GAPI 2.0 (2009-2011) alone did not lead to significant changes in this outcome (p=0,248).

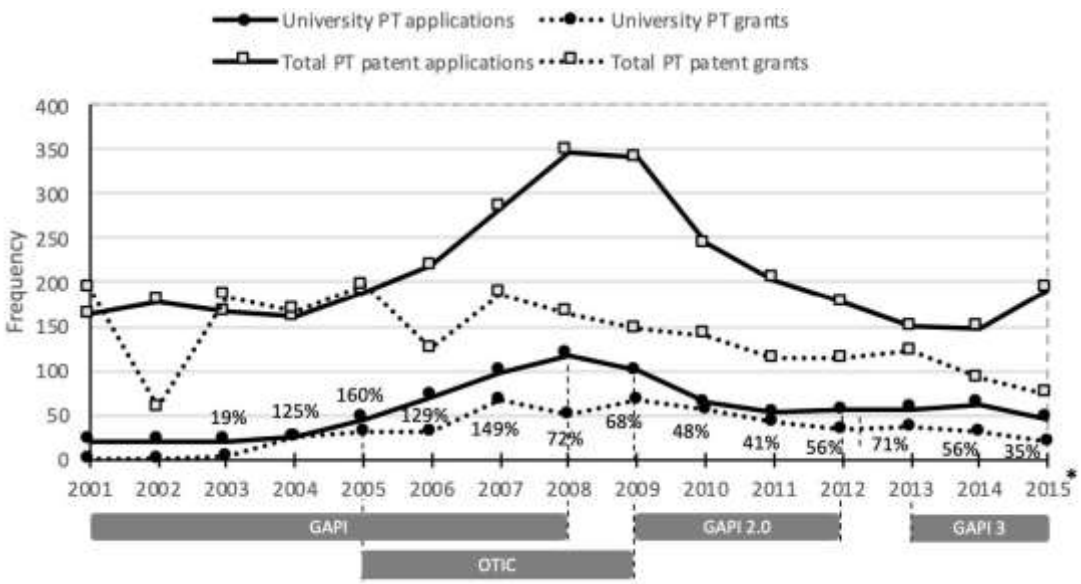

Fig. 2 - Development of Portuguese HEI-owned and total domestic patent filings and grants from 2001 to 2015. Percentage values represent the PT patent grant/application ratio. Provisional patent applications, introduced in 2008, were not included since detailed data is not publicly available. *Data only available for patents filed until October 30th 2015.

The role of these Portuguese public policies in patent granting was also assessed. Considering that the average time from patent application at INPI to grant is estimated at 28 months, a delay of 2 years was considered in the analysis of the effect of public policies on patent granting. From 2005 to 2008, the OTIC program promoted the formation of TTOs at universities with the objective of improving patenting and technology transfer activities. Therefore, the effect of GAPI and OTIC on the number of patents granted to universities in Portugal was evaluated from 2001 to 2015. Since the number of patent grants depends on the number of patent applications, the ratio between granted patents in the year n and the number of applications in the year n-2 was calculated. The statistical analysis revealed that OTIC program promoted a significant increase of the number of patents granted to universities (p=0,005) but did not lead to higher PT patent grant/application ratio (p=0,604). Conversely, the years under the influence of the first edition of GAPI (2003-2009) presented a tendency to increased PT patent grant/application ratios (p=0,079) while patent granting volume was not affected by GAPI initiatives. During the almost 15 years assessed in this study, 515 domestic patents were granted to Portuguese universities, constituting a granting rate of 60%.

3.3. The role of public financial support to the internationalization of universities' patent portfolios

Considering the Portuguese market size for most of the technologies under the HEIs patent applications, patent internationalization constitutes a critical step to exploit the technology in relevant markets by expanding the IPR to other countries. The decision to internationalize a patent application must occur until 12 months after the priority date and, from a HEI point of view, it likely depends on several factors such as the technology readiness level, the commercial interest and the existence of public policies supporting the internationalization fees.

In this study, the number of international applications was determined accounting Portuguese priority filings that followed international routes (PCT applications, EPO filing with national priority

and direct filing under the Paris Convention)., Portuguese HEIs presented an internationalization rate of about 24%, following international routes in 207 out of 852 priority filings. Alongside with the 852 HEI patents filed in the studied period, HEI/company's patents totalled 59 patents (Table 2). From these, 49% were internationalized, and the average family size was 1,90. Average family size for HEI/company's patents was found to be statistically different from the average family size of HEI's patents (p<0,001).

Patent applicant	PT applications	International applications	Average family size (±SD)
HEI	852	207	1,43 (±1,56)
HEI/Company	59	29	1,90 (±1,72)***
Total	911	236	

*** p < 0,001.

Table 2 – Patent internationalization profile of patents filed by Portuguese HEIs vs. patent filed by Portuguese HEIs in joint ownership with companies.

Specifically addressing HEI patent internationalization, a similar evolution was found for domestic and international patent applications (Fig. 3). As expected, the maximum volume of international applications occurred in 2009, one year later that the peak observed for the domestic filings in 2008.

From 2001 to 2015, two major initiatives focusing patent internationalization were in place: SIUPI and LAIP. Both supported European and PCT patent applications fees but SIUPI also supported the maintenance fees of patents granted less than 2 years ago. In the case of SIUPI, aggregated data between 2001 and 2006 was found publicly available at INPI (2007). The analysis followed the same methodology used for domestic patents, addressing the evolution of the number of university patent families with international applications from 2001 to 2015. The ratio between the number of international applications in the year n and the number of domestic applications in the year n-1, named internationalization ratio, was also determined. Our results showed that together SIUPI and LAIP did not have an effect on the number international applications filed by Portuguese universities (p=0,224) but the single analysis of LAIP revealed a significant increase of the internationalization intensity (p=0,041). However, no major differences were found regarding the internationalization ratio, which normalizes the international applications by the domestic patent applications.

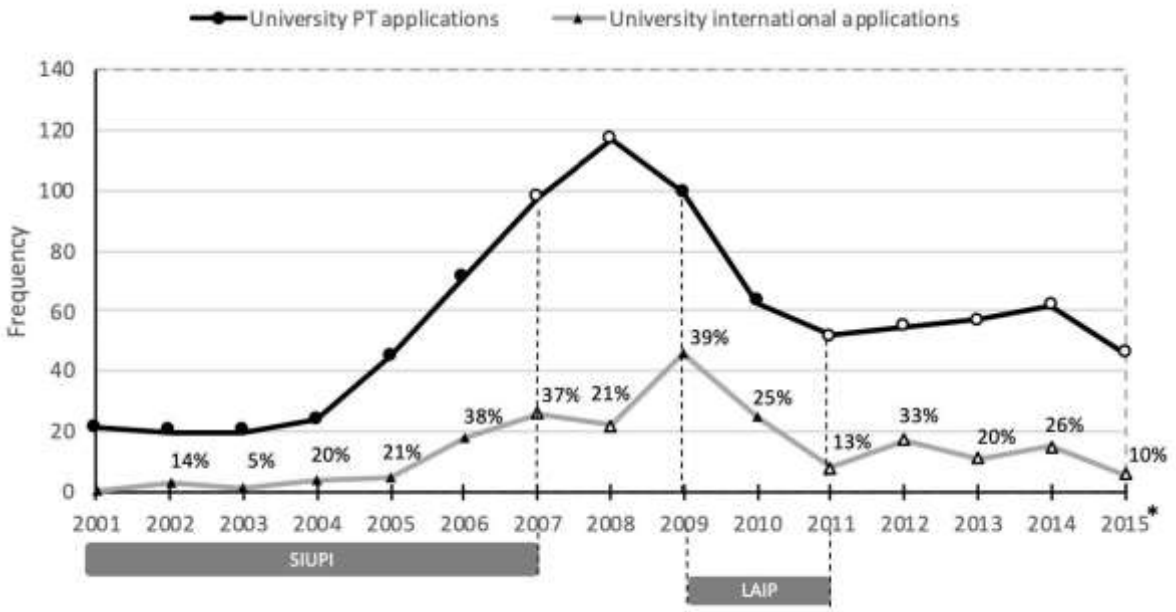

Fig. 3 – The evolution of domestic and international patent applications in the context of SIUPI and LAIP initiatives. Percentages represent the internationalization ratio. * Data was just available for patents filed until October 30th 2015.

Patent internationalization is expected to originate larger patent families due to the patent applications in foreign territories using the Portuguese priority filing. Therefore, patent family size was evaluated as an output of the public initiatives promoting patent internationalization, namely LAIP. In Table 3, the distribution of family sizes of international patent applications either supported or not by LAIP is presented. Our findings show that LAIP promoted small-sized patent families mostly constituted by the domestic filing and the PCT application. Importantly, patent families under the scope of LAIP were significantly smaller than the patent families not supported by this initiative ($p<0,001$). Of note, larger patent families were registered until 2007 ($p<0,001$).

	Family Size										
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**>=10**	*Total*
Not financed by LAIP	67	19	14	17	8	2	8	4	4	6	*149*
Financed by LAIP	37	4	3	1	1	0	0	1	0	0	*47*
Total	*104*	*23*	*17*	*18*	*9*	*2*	*8*	*5*	*4*	*6*	*196*

Table 3 – Distribution of Portuguese university-owned patent families according to their size and financial support through LAIP.

4. Discussion

Since 2001, Portugal has been introducing innovation public policies to promote the development of knowledge-based economy. In this context, intellectual property rights, in particular patents, have an important role in innovation by granting to the patent owner the right to exclude others from the market. Through innovation public policies, HEIs have been encouraged to patent technologies arising from research, therefore supporting technology transfer to industry and tech-based entrepreneurship. In this context, Portuguese HEIs, as public institutions, have benefited from the patent fee waiver foreseen in the law, and from specific public policies as GAPI, OTIC, SIUPI, and LAIP. Since Portuguese

HEIs have been the focus of these policies, it is of utmost importance to evaluate their effect on HEI patenting.

This study assessed 911 patents filed by 29 Portuguese HEIs from January 2001 to October 2015. From these 911 patents, 852 from which were filed by HEIs as single applicants or in co-ownership with other public institutions, and 59 patents were filed by HEIs and companies as applicants.

Our findings show that the first edition of GAPI was the initiative involving public funding that had greater effect on university patenting, leading to an increased number of domestic patent applications. This comes with no surprise, as it was the first initiative to institutionalize IP and technology commercialization teams in Portuguese HEIs. However, the effect was already observable by the end of 2006, suggesting that this initiative could have been phased out a year earlier. In terms of patent granting, two major factors were expected to be involved: the number of patent applications in the previous years and the proficiency level of staff involved in patenting. Although university TTOs' foundation was mostly supported by the OTIC program, and OTIC had a positive effect on the number of domestic patents granted to Portuguese HEIs, previous patent applications are the key determinant since no significant effect was observed when the number of granted patents was normalized by the number of patent applications filed two years before (average grant time in Portugal is 28 months). Overall, Portuguese HEIs filed three times more domestic patent applications in 2015 than in 2001.

HEIs have an important role in the Portuguese patent system. The acceleration in the total number of domestic patent applications observed in 2006 and 2007 was driven by Portuguese HEIs according to the reports of the Portuguese patent office (INPI, 2007, INPI, 2008). Moreover, the patent grant rate of Portuguese universities with INPI is 60%, which is substantially higher than the overall grant percentage in Portugal – about 40% since 2013 (INPI, 2016). Those facts may be explained by the foundation of TTOs in most Portuguese HEIs, which was supported by the OTIC program. This finding is in line with the literature that reports that the existence and efficiency of TTOs are positive determinants on the university patenting (Owen-Smith and Powell, 2001, Saragossi and de la Potterie, 2003, Cartaxo and Godinho, 2012).

The evolution of university patenting in Portugal may also be influenced by the macroeconomic environment. After HEI-owned patent filing reached its maximum value in 2008, the number of both applications and granting has decreased and stabilized since 2011 - the year of the last economic crisis and financial intervention. A similar scenario was found for the total number of patent applications in INPI for the same period of time. The provisional patent application route was introduced in Portugal in 2008, leading to an increase of the total the number of applications (INPI, 2016). According to INPI's data provisional patents represent 63% of patent applications but the total number of applications and conversions has been steady at about 300 per year.

This deceleration in patenting observed in Portugal since 2011 is likely related to budget restraints and lack of financial tools to support intellectual property protection observed during Portuguese financial crisis of the last decade (OECD, 2017). Difficulties in funding for R&D activities and technology-based business development were reported by the Portuguese national science foundation for this period (FCT, 2013). In this sense, it is also important to refer that most of the Portuguese HEIs are funded in more than 90% by public means (Rosa et al., 2009). It is also known that R&D budget has a direct effect on university patenting as studied for European universities (Acosta et al., 2009). The gross domestic expenditure on R&D (GERD) as a percentage of GDP in Portugal has been decreasing since 2009 (1,58), reaching the value of 1,28 in 2015 (OECD, 2017). This descent trajectory mirrors the one of Spain (1,22 in 2015) but is the opposite direction of the evolution of other moderate (e.g. Czech Republic, 1,95 in 2015) and strong innovator countries according to the European Innovation Scoreboard 2018 such as

Belgium and Ireland, which registered GERD in 2015 of 2,45 and 1,51, respectively (European Comission, 2018).

Research on university patenting has been increasing over the last years, but specific studies regarding patent filing strategies are scarce (Fisch et al., 2014, Saragossi and de la Potterie, 2003, Yamaguchi et al., 2016). The use of international routes such as PCT, EP or direct filings under the Paris Convention by the Portuguese HEIs was observed in 24% of the domestic patent application, and 49% when the domestic patent application was jointly owned between a HEI and a company. These values are lower than the average percentage of HEI patents that follow international routes described by other authors in Germany (Tinnemann et al., 2010) and in the U.S. (Fisch et al., 2014). German universities and public research organizations internationalized 60% of their patent applications between 1988 and 2006 through PCT (40%) or direct filings at the EPO (10%) or other territories (10%) (Tinnemann et al., 2010). Fisch and colleagues have found that the number of PCT applications accounted for 18% of all universities patent applications in a study involving universities from China, Europe, Japan, South Korea and the U.S. Nevertheless, if the authors have accounted for the use of other international filing routes such as direct via national priority filing or EPO filing, an internationalization rate of above 50% would be found using the detailed data provided for the top 25 universities of the ARWU ranking. Importantly, the group of universities studied by Fisch and colleagues among the top 25 PCT applicants worldwide included mostly American (16) and Japanese (4) universities, suggesting that the lack of patent internationalization is a question in Europe. The same study has also reported very low levels of patent internationalization (<5%) in Chinese universities, presenting an average patent family size of 1,3. Our data showed that Portuguese HEIs have patent families with a small average size (1,4 when the applicant is a HEI; 1,9 when the patent is jointly owned by a HEI and a company), in which domestic patents have a weight similar to the Chinese universities selected in ARWU ranking top 300. Overall, the Portuguese HEIs have been investing in domestic patents but lagging on their internationalization, both in terms of rates and territories for internationalization, when compared to university patenting worldwide.

In order to promote patent internationalization, Portugal has introduced innovation public policies. The best performance in terms of international patent filing by Portuguese HEIs was registered in 2009 with 46 applications through PCT, EP or direct filing. According to our results, university-owned patents internationalization was not affected neither by SIUPI and LAIP. Thus, that finding is likely explained by the historical maximum of 117 patent applications at the Portuguese INPI in 2008. Although LAIP has led to a significant increase in the number of international applications, it generated smaller patent families, mostly constituted by a Portuguese patent and PCT application. Therefore, globally, SIUPI and LAIP did not contribute significantly to the internationalization of HEI's patent portfolios, which is mostly domestic. Although LAIP induced a one-time increase of PCT international applications filed in 2009, the same funding had a negative impact on the international extension of university patents since LAIP-supported patent families presented a significant lower average size. LAIP supported PCT and EP patents filed by public or private institutions between September 6th, 2009 and December 10th, 2010, using the priority date of Portuguese patents. This financial incentive deeply impacted university patenting since it supported all (24 out of 24) PCT patent applications filed in 2010 by HEIs. In total, LAIP financed a total of 35 applications from HEIs. According to INPI's report on LAIP funding, the applications funded by this initiative were filed by Universities in 56% of the cases, 33% by companies and 11% by individuals (INPI, 2011). These results show the dependence on public funding of the internationalization of patents filed by Portuguese applicants, and not on market drivers.

The decreased level of patent internationalization presented by Portuguese HEIs in the last years may not be only related to the end of LAIP. The number of international patent applications by HEIs strongly decreased from 2009 to 2011. A similar trend was registered by the top 5 worldwide patent offices (USPTO, EPO, SIPO, KIPO, and JPO) (EPO, 2016) what is likely related to the worldwide effects on R&D

activities and business innovation caused by the global financial subprime crisis started in 2008 (Benoliel and Gaishboliner, 2015). Although a sustainable growth of the number of patent filings worldwide since 2011, Portuguese universities and polytechnic institutes still struggle to internationalize their patent portfolios. As previously described in the literature, the driving forces of national and international patents differ (Azagra-Caro et al., 2006) and increased levels of confidence on the R&D results and business are required to pursue costly international applications.

According to the data retrieved by our survey, 13% of the university patent families with a patent granted in Portugal have been commercialized. This value is low when compared with studied addressing the sale, licensing and creation of spin-off based on university patents (Giuri et al., 2013). Giuri and colleagues reported a percentage of commercialized patents of 21% and 37% for PROs and universities, respectively. The role of patents and the major problem in technology transfer from academia to industry is fairly established in the current literature and is supported by works from authors such as (Markman et al., 2005, Siegel et al., 2007). However, this commercialization problem experienced by Portuguese HEIs may also be affected by several factors. Firstly, the low level of internationalization and the small size of patent families owned by HEIs negatively impacts its valuation (Dechezlepretre et al., 2017) (van Zeebroeck and van Pottelsberghe de la Potterie, 2011) and the interest by global private players to licensee those technologies. Secondly, university TTOs in Portugal are relatively immature, since the majority of them was founded in the context of OTIC program (2005-2008). Additional challenges in patent commercialization derive from the inventors, whose involvement in further technology development is difficult to articulate with teaching and research activities (Rasmussen et al., 2006).

The idea of economic development, innovation and social engagement underlying universities' third mission has led HEIs to use patents to capture value. Since universities are non-practicing institutions, i.e. they do not actively market their technologies, they face the additional trap of accumulating a high number of patents that are not commercialized for long periods of time. In Portugal, the exemption of patent maintenance fees incentivises universities to keep domestic patents until the limit of 20 years - the total lifetime of a patent right. The rational underlying this strategy based in domestic patents is highly arguable considering the size and the nature of the Portuguese market. The fact that HEI patent portfolios mostly protect inventions in medical technology (A61K), instrumentation (G01N), and biotechnology (C12N) (data not shown) should prompt the international extension of HEI patents towards global and valuable markets.

Despite the absence of patent lawsuits prompted by Portuguese HEIs according to INPI's registries, university-owned patents may deter others from using those protected technologies as discussed in the literature (Duchêne et al., 2015, Rooksby, 2011) and as exemplified by the Carnegie Mellon University against Marvell Technology Group Ltd. and Marvell Semiconductor, Inc. lawsuit (Carnegie Mellon University, 2017). This aspect is particularly relevant for the university-owned patents of basic building blocks in new technologies as previously discussed in (Lemley and Shapiro, 2007, Lemley, 2008). Both exclusive and non-exclusive licenses are suitable tools for technology transfer with real impact on society as highlighted by the report recently published by the AUTM (AUTM, 2017).

Under the Portuguese legal system, specifically the Article 116 of Law 62/2007 of September, 10th (the Legal Regime of Higher Education Institutions - RJIES) and the Article 354 of Decree no. 47/2015 of December 31st (the Portuguese Industrial Property Code - CPI), the industrial property rights created in research context belongs to the HEIs, which are exempted of fees due to the fact of being public institutions (Article 12 of Law 108/88 of September 24th). To the best of our knowledge, this fee- free system is exclusive of Portugal. The standard approach implemented by USTPO, EPO, SIPO and JPO, 4 out of 5 top intellectual property offices, is offering fee reductions for universities, non-profit organizations, and SMEs. The reduction percentage varies according to the office with the USTPO (37

CFR 1.27) and JPO (Industrial Technology Enhancement Act) applying a 50% reduction, while in EPO it ranges from 30 to 50% through the use of application of Rule 6(3) European Patent Convention (EPC) in conjunction with Article 14(1) of the Rules relating to Fees (RFees). In China, SIPO offers a discount of 70% on filing and examination fees and patent annuities but the reduction is just applied during 6 years after the grant date. Additionally, Spain introduced in 1st April 2017 a new patent law ("Ley 24/2015, de 24 de julio") implementing major changes, namely in fee reductions and commercialization. Spanish public HEIs could claim exemption from patent fees, which was replaced by a reduction of 50% in filing, search, examination and annuity fees. In case of real and effective patent exploitation 4 years after patent filing (Article 90.2), universities may request the refund up to 100% of those fees. In light of the concept of Entrepreneurial State, the current patent fee waiver in Portugal is not acting as a driver for promoting patent commercialization, as the numbers of patent licensing show.

We recognize some limitations in this study. The selected approach underestimates the number of university patent applications and grants due to the fact that our search was based on Portuguese priority filings publicly available at May 30th, 2017. Therefore, as they are confidential, provisional patent applications filed by Portuguese universities and polytechnic institutes were not included. Additionally, international applications and further national validations using a provisional patent priority filing date were not accounted since these patents were not exempted from fees. In terms of number of granted patents it is important to refer that the values reported herein for the last years may not be final, as we based our data collection on the average grant time reported by INPI is about 28 months. Another important limitation regards patents commercialization. The total number is likely to be undervalued, since not all TTOs contacted have answered to our request. Furthermore, it was not also possible to guarantee that the total number of licenses reported by the TTOs who provided aggregated data was not including co-ownerships with private entities.

5. Conclusions

University patenting is critical in transferring technology from academia to industry, namely in high-tech domains. Our study shows that the first edition of GAPI was the innovation policy measure introduced by the Portuguese Government since 2001 with the most positive impact on the number of applications filed by universities. Although public funding supporting international routes has been available between 2009 and 2011, Portuguese universities underperformed at filing international patent applications. Our findings show that HEIs patent portfolios, whether held by HEIs or jointly owned by HEIs and companies, are mostly composed by domestic patents with the predominance of small sized patent families, which likely impairs further commercialization. Since Portugal's market size is too small to encourage technological-based businesses, patent internationalization is vital to support commercialization.

The analysis of patent data revealed that Portuguese HIEs face difficulties at internationalizing and commercializing their patents. Our analysis suggests that the public policies based on public funding for patent internationalization in Portugal combined with the patent fee waiver is not prompting an effective technology transfer to industry. The fact that HEIs are exempt from paying patent fees also means that there is no incentive for a rational management of the domestic patent portfolio, as the IPR lasts for its lifetime in Portugal, even without use or commercialization. The impact of this market exclusion from the Portuguese market is unknown. It is also unknown whether these patents are being used elsewhere in the world, as the technologies they protect are in the public domain in other countries. The review of other practices, such as fee reduction and refund, or the consolidation of technology offers from HEIs, should be considered.

Future research related to the sustainability of public policies in the support of technology transfer from universities to industry could address the alignment between public innovation policies and the smart specialization strategy. Also, as Portugal 2020 has calls directed at IP support, it will be interesting to evaluate its impact on patents using the methodology we proposed in our analysis. Overall, further studies are required to clarify how university patents and patenting strategies may be used to foster technology commercialization with a real impact in the economy.

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Reading through Pictures
An interpretative study of art and design academics between 1960s and late 1970s in Porto

Eliana Penedos Santiago (Design Researcher in Faculty of Fine Arts, University of Porto, Porto, Portugal)
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Introduction

This article stems from an analysis of the life and work of a group of artists who graduated from the School of Fine Arts (ESBAP) in Porto between 1957 and 1986, a period surrounding the social and political revolution of 25 April 1974. The associated research is being developed under the project *"Wisdom Transfer: towards the scientific inscription of individual legacies in contexts of retirement from art and design higher education and research"* (POCI-01-0145-FEDER-029038).

The project stems from the evidence that there is insufficient inscription and utilization of individual knowledge and experience which retired teachers and researchers of art and design can offer.

Considering that research in art and design has only recently been validated as a scientific discipline, it can be argued that its provenance may reside in an older generation of researchers who were the first to lead the transition of mindsets regarding creative production in practice and academics. This legacy has remained largely outside the sphere of validation in current higher education and arts and design research. The alluded generation of art / design experts is often confronted with the lack of conditions for welcoming and enhancing their experiences and professional testimonies beyond the standard requirements of academic projects and curriculum.

The project thus approached prominent individuals from the reference period and community to conduct a series of informal conversations. These sessions were often held in their personal studio / home, which provided the added possibility of studying certain artefacts / art pieces that were either of the artists' own making or shared a profound connection with their life history. These meetings also evoked a sense of the generation as being immersed in crafting by hand and extending their work and ideas through social gatherings and interpersonal connections, in contrast to the largely impersonal digital workflows and networking approaches in contemporary times.

These testimonies also lead to a conjecture whether as to such long-term dedication to teaching on behalf of the artists, either in parallel or in alternate phases to their personal work, was indeed an act of preserving their self and expertise through constantly shifting generational realities, which the said engagement with students afforded. An inscription in this regard, that details their insights and contributions over the decades, can thus be of significant value to depth and domain of creative studies.

Correspondingly, the aim of the research is to establish a basis upon which the impact of the referred generation of art and design scholars on knowledge, culture, and the overall social fabric can be acknowledged, discussed, and reactivated in future contexts.

Methods

Considering the lack of inscription in the above presented context, direct and indirect methods of engagement and observation, such as interviews with open-ended questions (Quivy & Campnhoudt 2008, p.164), have played a critical role towards collecting data.

In addition to interviewing retired/retiring artists and art professors who graduated from Porto School of Fine Arts (ESBAP) during 1960's and 1970's, the study also incorporated insights from Professor Lúcia Matos, the present director of the Faculty of Fine Arts in the University of Porto, taking into account the scope of her studies and projects that includes this generation of artists.

A critical aspect of engagement with the target community, in a majority of cases, has been the possibility of conducting interview sessions within the artists' personal /studio spaces. This provided means to obtain a set of exclusive observations within the interviewees' testimonies, and the opportunity to witness first-hand, some of the practices that characterized their creative process and were also integral to the methodologies they presented to their students. In process, certain audio-visual recordings were made which allowed further scrutiny of the collected observations in subsequence (Banks & Zeitlyn 2015, p.107-109).

The period in question when the artists graduated, was fraught with turmoil in Portugal, however, it proved to be decisive and exceptionally prosperous in terms arts and design, and the testimonies help reconstruct a chronology of pedagogical experiences in this regard.

This article evaluates interviews with fifteen individuals which were conducted between December 2018 and March 2019 and includes seven male and seven female interviewees divided across the disciplines of sculpting and painting, alongside the current director of the Faculty of Fine Arts, University of Porto. The absence of individuals with a formation in design is due to the fact that the communication design course at the school commenced in 1976, and its graduating batch falls outside the scope of the project's intended timeframe.

Name	Course	Start	End	Higher education teacher	Elementary and secondary schools teacher	School Administration
Armando Alves	Painting	1957	1962	ESBAP 1962-1967 & 1969-1973		
Carlos Carreiro	Painting	1967	1972	ESBAP/FBAUP 1977-2003		
Carlos Marques	Sculpture	1967	1975	ESBAP/FBAUP 1977-2006		Director of ESAD & School councils at ESBAP
Elvira Leite	Painting	1957	1962	Faculdade de Psicologia e Ciências de Educação da Universidade do Porto 1989-2003	(both) Carolina Michaelis and Rainha Santa Isabel 1969-2000	
Graça Morais	Painting	1966	1971		(both)	
Haydée De=Francesco	Sculpture	1956	1961		Aurélia de Sousa e Gudi	
Helena Almeida Santos	Painting	1961	1966		(both) Angola	

Name	Course	Start	End	Higher education teacher	Elementary and secondary schools teacher	School Administration
Isabel Cabral	Painting	1967	1973		Escola Artes Decorativas Soares dos Reis 1982-2010	
João Machado	Sculpture	1963	1968	ESBAP/FBAUP 1977-1983		
José Paiva	Painting	1968	1986	ESBAP/FBAUP since 1995	Escola Artes Decorativas Soares dos Reis	Diretor of FBAUP 2014-2018
Lima de Carvalho	Painting	1967	1972	FBAUL		Diretor of FBAUL
Lúcia Matos				ESBAP/FBAUP Since 1987		Director of FBAUP since 2018
Manuela Bronze	Painting	1975	1981	ESMAE, ESE		
Maria José Aguiar	Painting	1967	1972	ESBAP/FBAUP 1977-2009		
Mário Américo	Painting	1962	1972	ESBAP/FBAUP 1987- 2005	(both)	

Table 1 - List of interviewees

As iterated earlier, the mode of interviewing with open ended questions (Quivy & Campnhoudt 2008, p.164) proved crucial towards guiding and adapting the semi-structured conversations through a wide range of topics — with a focus on the artists' experiences as students and teachers, curricular and extracurricular relations, foreign associations, and the influences and impacts of the political landscape on their work. The method also helped maintain a flow of narrative that was comfortable for the interviewees, encouraging spontaneous readings and interpretations of situations that were relatively personal and/or sensitive in nature.

Subsequently, a draft of the interview questions was only requested by one participant, with the rest agreeing to the open interview model. The sessions were conducted individually. Although the possibility of holding conversations with more than one participant at a time was considered, the option was not not pursued in anticipation of any dilution or holding back of insights that such an approach may incur.

In conjunction to the generated wealth of information from the encounters, the sessions that were concluded in homes and studio spaces also provided the opportunity to contextually cross reference respective correspondences with sets of visual artifacts (Banks, 2001), such as photographs (Tinkler 2013, p.188-190), archives of collected objects, and productions of other artists, thereby serving to dynamize the recorded content. Such contact allowed a simultaneous acquaintance with the artists'

past and present — in terms of work practices, ideas and ideologies, study subjects, and creative outputs. The average duration of the interview sessions was 120 minutes.

The political landscape

Educational reforms and the emergence of design as a course

Testimonies from the female participants indicate a significant prevalence of men over women in the faculty at the academy of art in the 1960's and 1970's. According to one of the interviewees, Elvira Leite (2019, personal communication, 15 January), despite the significant presence of female students after the 1957 education reform (Stoer 2008, pp.17-48), there was no evidence of presence of female teachers in the academy before a public tender was opened in 1975.

Before the Carnation Revolution of 1974, the prevailing dictatorial regime maintained rigorous censorship over all forms of self expression, including in the sphere of art, and were aided by 'Little Salazars', the local agents loyal to the regime (J.Lima de Carvalho 2019, personal communication, 31 January), who exercised additional, and at times more oppressive measures of control over people. The entailing conservatism in society emboldened gender repression, as evidenced by strict dress codes for women, such as white coats for painting classes in Elvira Leite's student years, to different lengths and colours of attire as per the time of the year (H.Matos 2019, personal communication, 7 January), that were often misunderstood leading to penalties in different forms. Many female interviewees, including Isabel Cabral (2018, personal communication, 28 December), Graça Morais (2019, personal communication, 31 January), and Maria José Aguiar (2019, personal communication, 14 January) vividly remember demeaning sexist comments from male teachers and gender bias in evaluation as being commonplace.

Fig.1- Photography ©Elvira Leite - ESBAP 1961: Elvira and colleagues in their painting class.

In 1971, the then minister of education, Veiga Simão presented The School System Project alongside the General Guidelines for Higher Education Reform at the National Assembly. It was noted that *"The purpose of the reform was to serve the people: knowing how to read, write and count is no longer enough for the people of Portugal. The criteria for social justice and demand of modern life lead us to aspire and plan for all, an education system that allows their realization in full as individuals and citizens"* (Contas à Nação, January 1972, cited in Rodrigues, 2014). In 1973, the proposal was agreed, and a corresponding decree was passed to allow certain reforms in the ambit of the education system, including the introduction of a degree of democratization - a first in the context of the prevailing nationalistic and conservative political situation. However, before Veiga Simão's suggested reforms could be implemented, the military coup of 25 April 1974 restored the democratic state.

In 1975, the Student Civic Service was created as a foundation year to higher education, as a part of the reform agenda under the reconstitution of the country after its liberation from dictatorship. It consisted of several activities focusing on community service with a view to inculcate socially productive work culture within the student population. The universities were accordingly provided with greater pedagogical, scientific and financial autonomy. Interviewee Manuela Bronze (2019, personal communication, 4 January) remembered her starting year in ESBAP, 1975 — a year Lucia Matos termed as *"a chaotic year without classes"*(L. Matos 2019, personal communication, 24 January), when she received the opportunity to be integrated into a group of the service whose engagement was based on ethnographic work developed by Michel Giacometti in Portugal a few years earlier. This project was conceived during a phase of rampant social and political changes, where in people were looking at universities to address major needs and necessities, starting with further participation of students in civic activities.

Already, marked changes had begun taking effect with respect to the role and contribution of women in Portuguese society and culture. In 1976, Maria José Aguiar, together with Marta Kopzle and Maria Beatriz Alçada applied for faculty positions at ESBAP, and within a year, all three came to represent the first foray of women into arts education in Portugal.

Another interesting and to some extent controversial aspect of the ongoing reforms was regarding the access to higher education, where in students of vocational schools receiving technical education and workers over the age of 25 with proven 5 years of work experience became eligible for receiving educational degrees equivalent to traditional higher education courses (Rodrigues, 2014). In this context, students who earlier had not even met the required criteria for passing 5th grade, were presented the opportunity to appear for an examination to gain entrance into higher education.

In retrospect, this decision was criticized for the lack of rigor and for undermining quality and ethics of pedagogy. Helena Almeida Santos, who once considered enrolling for the same, saw a paradigm shift education, from a system that was once stringent and dogmatic in terms of academic conduct, to an arrangement that perceivably invited anarchy.

Post revolution teacher, João Machado (2019, personal communication, 1 March) remembers a challenging period for professors who were routinely confronted by increasingly belligerent students with undue demands. It was also a time when advocates communism held greater sway than those who still chose to defense fascism. Lúcia Matos in this context recalled how the minimum passing grade was amended from being 14 out of 20 to 10, leading to 100% approbations. Manuela Bronze, who had just been admitted to the academy in 1975, remembered her first year as one of ad-hoc courses, and points to older aged students and the prevailing reactionary mentality as catalysts for such confrontations. However, she also noted a marked enrichment of the creative/academic environment at the academy due to the coming together of different generations, vocations and experiences.

Many other artists, such as Isabel Cabral and Rodrigo Cabral who had earlier been active in the revolutionary scene through their works (such as murals and street performances with pro-democracy messages), had devoted a decade or more to the cause and, and found it pertinent to exercise patience in the current state of flux.

According to Lima de Carvalho, the 74' reform was predominantly theory-oriented. Subjects relating to aesthetics and psychology being reinforced in order to create a basis for scientific production. Once director of Lisbon School of Fine Arts (ESBAL) the artist uses this opportunity, to expand its scientific production and ultimately gain entry into the University of Lisbon.

Results

The sense of school

From the classroom into the debates in different areas of the city.

These results are preliminary and describe the narrative context.

This is a first approach to the gathered content that will be subsequently subjected to detailed analysis.

The practice of the generation in focus was greatly influenced by skills that were manual in nature, or *"learning by doing"* according to Carlos Carreiro (2019, personal communication, 16 January). They also used debates as a platform to disseminate their ideas and relied on interpersonal relationships for networking. José Paiva (2018, personal communication, 17 December) also highlighted the concept of *"open-door classrooms"* during the time, when a *"sense of class"* was absent, with teachers employing a more relaxed approach to enable open and unrestricted flow of knowledge and communication.

Debate sessions were, however, an integral part of the academy's culture even in the 1960's. Interviewed artists pointed out that debates were held in spaces inside the premises of the school, as well as in certain *"satellite spaces"* of the community in other parts of Porto, such as Teatro Experimental do Porto, Café Piolho, and Café São Lázaro. Lima de Carvalho further suggested that ESBAP and its community was to some extent the city's artistic and cultural centre, and a contact point for students, teachers, artists, writers, thinkers and philosophers to meet and discuss thoughts and ideas.

Other important occasions for conviviality in the 1960's included the Magna Exhibitions that were of considerable importance to the academic community and were held around the All Saints' Day celebrations in October. Lima de Carvalho recalled how traffic would be stopped on the street in front of the school to accommodate the crowd which would gather to see the exhibition. In the meanwhile, devout women returning from paying respects to their ancestors at the Prado cemetery nearby would walk in inadvertently and get shocked by the exhibition's contents. Acts of embracing the community at large would also take place during the evening open classes in the attic of ESBAP, according to João Machado, when students from other disciplines such as medicine, law and humanities, with passion for drawing, would be welcomed with buckets, ink, drawing sheets and nude models.

Elvira Leite also conveyed how in her time as a student at the academy (1957-1962), architect Carlos Ramos, the director of the school at the time, would dedicate one day in a year to encourage further interaction and bonding between teachers and students. Often held in the village of Entre-os-Rios further upstream in the Douro valley, the day would be marked with celebrations, including motivational speeches, Magustos or Portuguese-style bonfires with singing and dancing, and would typically conclude with a lamprey dinner.

Fig.2 - Photography ©Elvira Leite - Magusto ESBAP 1961: Bonfire Jump

Fig.3 - Photography ©Elvira Leite - Magusto ESBAP 1961: Bonfire Jump

There were additional references to how spending time together outside the confines of the classrooms, such as in the school garden or during after-hours would contribute to the rapport between teachers, students and staff.

Correspondingly, it was common for teachers to nurture such camaraderie in more restricted circles, through private soirees that were often presided by eminent artists, where in certain hand-picked students would be invited to attend. In this regard, Helena Almeida Santos spoke of the *"José Rodrigues Core"* while Elvira Leite recalled, with much longing, the hours spent with artist Lagoa Henriques, her drawing professor, at his house *"thinking and discussing art".*

Lima de Carvalho also credited such gatherings for the good proximity that he shared with his teachers. He specifically recalled get togethers organised by painter Júlio Resende *"with baskets full of food",* which were highly popular at the time.

Additionally, shared studio spaces formed a critical part of the bonding process between master artists, teachers and students, away from the school's limits and debate hubs.

Armando Alves (2018, personal communication, 5 December), for example, shared this studio, that he maintained until 2015, with other eminent artists such as José Rodrigues, Ângelo de Sousa and Jorge Pinheiro, but also opened its doors to his students who did not have a space to work. Similarly, Mário Américo (2019, personal communication, 25 January) was an apprentice at the studio of the famous modernist painter Dórdio Gomes during his initial years upon receiving the Gulbenkian scholarship at the age of 16. Later on, when he became a student at ESBAP he would already be widely considered as a promising talent and happened to share Gomes's studio space with Júlio Resende, José Rodrigues and Ângelo de Sousa, who were then also starting out as young and upcoming artists.

Carlos Carreiro too gave particular importance to extending this culture of amiability with his students and would transform his classes into painting studios where in everyone would feel more at ease to exchange ideas and experiences. In his time as a teacher, he was given charge of the first-year students, and every year, he would organize an event called the *"freshman reception"* to integrate new entrants, who had arrived from around the country, with the school´s convivial ethos. In this regard, during a day in the second week of a new academic year, he would invite the students from the starting batch to his personal studio to give a practical introduction to painting, including tips and tricks of working with acrylic, his specialty. Informal conversations over snacks afterwards in his living room would contribute further to eliminating distances between the attendees.

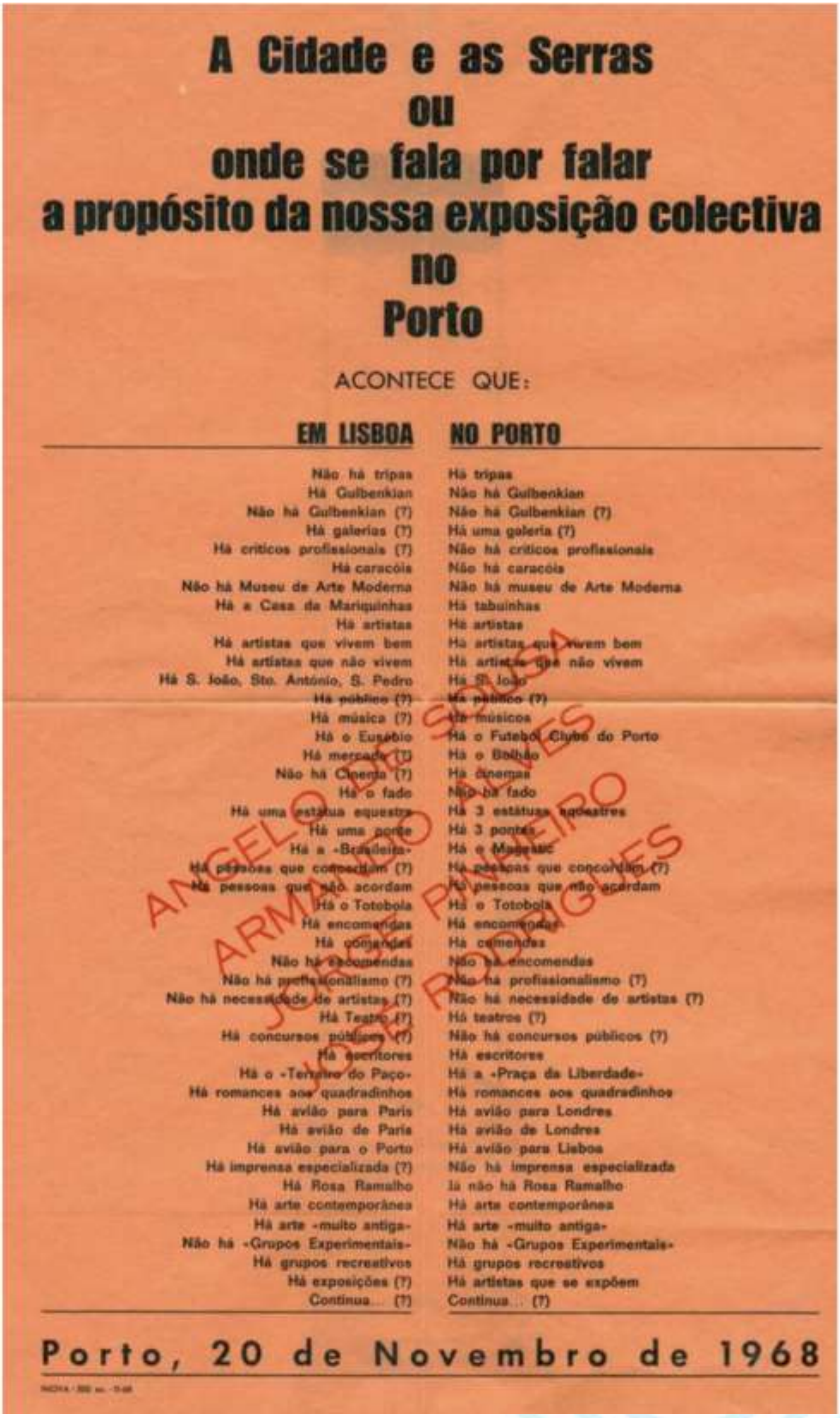
Foreign influence

In the mid 1960's, although the artistic community in Porto admired and was curious about parallel happenings in cities such as Florence, London, and Paris, direct contact with outside countries was yet limited. A rare instance of a Portuguese artist receiving the opportunity to travel internationally, however, did occur when Dórdio Gomes was awarded the Paris Prize in 1910. Lima de Carvalho remembers Gomes telling him personally about how when students who traveled abroad for holidays, would often find *"colleagues, artists and pseudo-artists"* waiting for them at the train station upon their return, hoping to gain valuable insights from their experience. Many of these students were also fast-tracked into teaching roles in anticipation of the knowledge which they may have acquired during their foreign trips.

In terms of the influence which foreign artists or designers may have had on the local community, Armando Alves explained that while names like Sebastião Rodrigues were iconic in design from a national perspective, there existed great admiration for people, styles and techniques from England and

Italy. It was still difficult to find books on the related subjects and imported magazines were usually very expensive. The books that could be found in the ESBAO library were outdated and in black and white print. Thus, for Isabel Cabral to see a Piet Mondrian painting in flesh on a trip to London in the late 1960's was a revelation.

Lúcia Matos also added in this regard as to how in the 1960's, the point of reference for art students changed from Paris, which had been the case since the turn of the century, to London. This phenomenon finds further mention in a manifesto "A Cidade e as Serras" (*The City and the Mountains)* , by the collective 'Os Quatro Vintes' (The Four Twenties) formed by Ângelo de Sousa, Armando Alves, Jorge Pinheiro and José Rodrigues (the group was named so because each had obtained the highest passing grade of 20 at the end of their respective courses). In the manifesto, the artists write that while in Lisbon*,"There's a flight to Paris"*, in Porto, *"There's a flight to London",* which curiously factually correct, since at the time flights to London only took off only from Porto, but it also alluded to their assertion of London as the Artistic Center of Europe (Pinheiro, 2013).



A Cidade e as Serras ou onde se fala por falar a propósito da nossa exposição colectiva no Porto

ACONTECE QUE:

EM LISBOA	NO PORTO
Não há tripas	Há tripas
Há Gulbenkian	Não há Gulbenkian
Não há Gulbenkian (?)	Não há Gulbenkian (?)
Há galerias (?)	Há uma galeria (?)
Há críticos profissionais (?)	Não há críticos profissionais
Há caracóis	Não há caracóis
Não há Museu de Arte Moderna	Não há museu de Arte Moderna
Há a Casa da Mariquinhas	Há tabuinhas
Há artistas	Há artistas
Há artistas que vivem bem	Há artistas que vivem bem
Há artistas que não vivem	Há artistas que não vivem
Há S. João, Sto. António, S. Pedro	Há S. João
Há público (?)	Há público (?)
Há música (?)	Há músicos
Há o Eusébio	Há o Futebol Clube do Porto
Há mercado (?)	Há o Bolhão
Não há Cinema (?)	Há cinemas
Há o fado	Não há fado
Há uma estátua equestre	Há 3 estátuas equestres
Há uma ponte	Há 3 pontes
Há a «Brasileira»	Há o Majestic
Há pessoas que concordam (?)	Há pessoas que concordam (?)
Há pessoas que não acordam	Há pessoas que não acordam
Há o Totobola	Há o Totobola
Há encomendas	Há encomendas
Há comendas	Há comendas
Não há encomendas	Não há encomendas
Não há profissionalismo (?)	Não há profissionalismo (?)
Não há necessidade de artistas (?)	Não há necessidade de artistas (?)
Há Teatro (?)	Há teatros (?)
Há concursos públicos (?)	Não há concursos públicos (?)
Há escritores	Há escritores
Há o «Terreiro do Paço»	Há a «Praça da Liberdade»
Há romances aos quadradinhos	Há romances aos quadradinhos
Há avião para Paris	Há avião para Londres
Há avião de Paris	Há avião de Londres
Há avião para o Porto	Há avião para Lisboa
Há imprensa especializada (?)	Não há imprensa especializada
Há Rosa Ramalho	Já não há Rosa Ramalho
Há arte contemporânea	Há arte contemporânea
Há arte «muito antiga»	Há arte «muito antiga»
Não há «Grupos Experimentais»	Não há «Grupos Experimentais»
Há grupos recreativos	Há grupos recreativos
Há exposições (?)	Há artistas que se expõem
Continua... (?)	Continua... (?)

Porto, 20 de Novembro de 1968

Fig.4 - *Quatro Vintes* Manifest 1968, “A Cidade e as Serras ou onde se fala por falar a propósito da nossa exposição coletiva no Porto.” Inova, Porto.

Elvira Leite, during her teaching years, took inspiration from the works of Bruno Munari, and once visited erstwhile Yugoslavia to attend a conference in which the Italian master would also be present. Although she went strictly as a spectator without any intention to showcase her portfolio or pedagogic work, she found an opportunity to share it with Munari. Since then, they maintained a regular line of correspondence until Munari passed away in 1998.

Fig.5 - Wall at Elvira Leite´s living room – Letters sent to Elvira by Bruno Munari.

The relationship between the silver generation and education.

Arts and design teaching in Portugal

Teaching as a career was always a point of consideration for new graduates in Fine Arts, either borne out of natural inclination or necessity. All artists who were interviewed had a well-established relationship with teaching, full-time or part-time. Elvira Leite discussed how her teacher Júlio Resende would organise classes for his arts students in primary schools in order to provide them with an early experience of teaching. She remembered how Resende, during a similar session at the São Vitor primary school in 1962, declared that a majority of the art students would go on to become teachers themselves, as it was the only possible way to survive, saying, *"Some will be painters, others will be [recognised] artists. Possibly, only artists could survive"* (E.Leite 2019, personal communication, 15 January). That day he would also suggest two books on artistic teaching, aiming to impart a basis for the students' envisioned future. This particular experience felt momentus for Elvira Leite as she realised that becoming an art teacher could culminate in a fulfilling personal and professional path where she could justly express and manage her creative talent. After she finished her course, the artist maintained her presence at the studio that she had utilized as a student for two more years. By the second year of this phase, she had already begun teaching, however, the time designated for her private work would often

coincide with the hours under her teaching commitment. Thus, *"at the peak of hers acceptance as a painter"* (L.Matos 2019, personal communication, January 24), Elvira Leite decided to dedicate herself exclusively to teaching. In this regard, the artist argued that although she had carried forward her knowledge and thematic discourses to the new role, the processes involved in incorporating these were different, and she had to organise her approach accordingly. In this manner, Elvira Leite found the artist within through teaching, rather than through being an independent painter. She made the classrooms her studio and considered the classes as her works of art. Consequently, the artist gained significant national and international recognition for her contribution to art pedagogy.

Dilemmas regarding maintaining of parallel lines of work between teaching and private practice emerged as a recurring theme during the interview sessions. Armando Alves, upon finishing his course, had taught in ESBAP for 12 years, when he received an invitation to manage 'Editorial Inova', a publishing house. He soon understood that it was impossible to sustain both fronts as each had unique and extremely demanding responsibilities, and to engage with both simultaneously could potentially compromise the expected outcomes.

Haydée De=Francesco (2019, personal communication, 21 January), also made the school arena her space for creative struggle. After graduating in sculpture, she immediately got assigned to faculty roles in elementary and secondary level education, and only after the educational reform of 1973, did she find the opportunity to return to her primary vocation of being a sculpture artist. De=Francesco would later be instrumental in the implementation of a course on fashion modeling at the Aurélia de Sousa Secondary School, a first such instance in the public-school system in Portugal.

Correspondingly, Helena Almeida Santos and Isabel Cabral too cited an early intent of pursuing a career in teaching, focusing their creative drive towards art education instead of strictly private practice.

In the academic year of 1962/63, Armando Alves shared an essay with Carlos Ramos, the school's director at the time, on the initiation of Graphic Arts within the discipline of decorative painting. Ramos was impressed, and invited Alves to present it as a part of the Magna exhibitions to be held that year, thereby putting in motion the inculcation of design for the first time in ESBAP. In preparation for the same, Alves had his students contribute towards the creation of a text and image database consisting of clippings from magazines such as Marie Claire and Paris Match. Elements from the material that was collected, including single cuts and collages, were used and reused for explaining parts of the essay dedicated to designing book covers and album artworks (A.Alves 2018, personal communication, 5 December). Alves also attributed the subsequent success and advancement of graphic arts as a standalone discipline in ESBAP to the dedicated work done by his students, in particular João Dixo and Nuno Barreto.

<u>The student's experience as part of the teaching model</u>

When discussing ties of empathy between the teachers and students, the artists pointed out that interpersonal relationships were bound to suffer if the teacher assumed a position of superiority and/or showed insufficient dedication to communicate. Lima de Carvalho termed it as the *"old school of fine arts"* where teachers would speak little as the students worked, and would walk around the classroom, stopping and correcting students' works without offering relevant explanations.

Lima de Carvalho was assertive when he said that he had never re-touched a student work, in a way which suggested that a similar experience during his student years may have left a lasting impression and influenced his personal approach to teaching later on. He identified the pedagogic conduct of teachers up until the end of 1960's as being a *"philosophy of the masters, of doing as the master",* implying that they may have reproduced the spirit of interaction which they had themselves been

subjected to during their formative years. On the other hand, Lima de Carvalho argued that the new generation of artists who began their careers at this time (end of 1960's - early 1970's), bucked this trend while deeply respecting the legacies of the earlier masters, and hence, they were the real teachers.

Carlos Carreiro, referring to class called 'Introduction to Painting Techniques', remembered his teacher Ângelo de Sousa as being one of the most liberal figures who would give more contemporary references than other professors. Júlio Resende, on the other hand, would contribute little or nothing to his students' works, at best providing minute observations such as *"give a little flavour to the colour"* or *"put more quality in the picture"*. In this way, Carreiro supposed, that the masters intentionally omitted certain elements of knowledge, such as methods or tools, which they believed would serve the students better to discover naturally, without being spelt out. Lúcia Matos agreed to this view, stating the absence of course preparation, methodologies and objectives as a possible reason, which invited spontaneity of action from the teachers, without any anticipation of students' needs.

When Carlos Carreiro started his career as a teacher at ESBAP in 1977, there was no formal pedagogical training provided to guide him through the initial stages of uncertainty regarding course development and teaching procedures. The students wanting to pursue a teaching career could, in theory, access the subject of 'Pedagogy' at the Humanities faculty in the University of Porto, however, it was generic and contained little more than bits of information on how to apply for a pedagogical internship.

Carlos Carreiro recalled how these experiences as a student helped shape his teaching career of 26 years. He laid particular emphasis on communicating well with his own students, and the corrections that he advised or the detailed explanations that he gave in relation to techniques were always cherished. It was for this reason, according to him, that he never left the first year as a teacher. He added to such conviviality by extending invitations to his home and studio, thereby offsetting some of the distance that his teachers may have established with him.

Mário Américo inferred, in consideration of his personal experiences, that as a teacher it was important to support students' individual growth pertaining to intellect, imagination and creativity. While respecting the students' individual space, the teachers should encourage thought before action. Américo had previously experienced a semblance of the same as a young apprentice in Dórdio Gomes's studio, where he would gain valuable insights on the subject from illustrious artists who would be present. In 1962, when Américo commenced with his education, Ângelo de Sousa, recently graduated, joined the academy as a teacher. Américo remembered attending one of de Sousa's classes in which the teacher observed and commented on artworks of all his colleagues, except Américo's, who was seeking an approach to dead nature, superimposed with multiple vanishing points in a stained-glass technique.

At the end of the lesson, when Américo approached de Sousa with his queries, the teacher explained that the subversion of his model could only happen later. Although de Sousa recognized his students' early maturity, he understood that this should not be considered as a factor for developing a proper learning path. The experience was a setback for Américo leading to demotivation, and a sense of time lost that could never be recovered. When years later, he would begin his own teaching career, he promised to himself to *"never tell any student to draw only what was in front of him."*

Armando Alves as a student often lamented on the low productivity and the time wasted during the 'Statue Drawing' class. In ideal situations, the most devoted of students would produce six to seven drawing a year, rounded off with an exam at the end. With the respective teacher being absent most of the time, the students would inevitably spend their class hours in the school garden. Carlos Marques also spoke about this issue, when in absence of the teachers the class would often be presided by technicians like "Mr. Gonçalves " (2019, personal communication, 11 December). In 1962, when

Armando Alves started his teaching career at ESBAP, he was given charge of this discipline alongside decorative painting. Despite his relative inexperience in the subject, he made it a point to introduce sweeping changes to the course that would help increase the quality and quantity of work produced. Correspondingly, in addition to depicting statues in school, Armando Alves took the students to the street and gardens of Porto, with a view to improve their work with charcoal and light essays, instituting *"street drawing"* as a new activity.

Abel Mendes, who was Manuela Bronze's painting teacher in ESBAP in 1976, once made a resolve to experiment with new models of teaching. At a time of great change and uncertainty, she decided to teach painting to the same batch across 5 years of their degree. Although Bronze acknowledged the quality of Mendes as a teacher, she argued that this was not a positive move, as it limited her means to access different perspectives and opinions that were vital to her intellectual growth. Carlos Marques too agreed with her in this regard, and in 1993/94, collaborating with Carlos Barreira and Zulmiro de Carvalho, he organized a workshop to update teaching methods in sculpture, with a view to guarantee a constant renewal of practices.

Discussion

If the first half of the 20th Century can be characterized by stories of romance of a distant country, the figure of Master deified by his chosen disciples as a *"a kind of a character's glorification"* (A.Alves 2018, personal communication, 5 December) with whom he communicated with minced words, the second half represents a new and extensible vector of communication.

This group of artists and teachers have made a profound influence on pedagogy of art and design in Portugal. It represents a generation to whom manual skills, debates, and in particular, interpersonal relationships were of paramount importance. The teaching models that they developed were derived from research processes that were based on empirical evidence, resulting from observation, interpretation and transfer of active/passive experiences. These models were tested in live scenarios, before being adjusted and implemented as practice-based methodologies.

As higher education students of art, this generation experienced a significantly different school environment to the one that they would foster as teachers. Their formative years were fraught with experimentations and their resulting uncertainties; however, the situation also allowed a certain openness towards the cross-fertilization of knowledge within and outside of the school premises. The learning process often progressed according to the richness of the relationships established between the teachers and the students. The classrooms, the school garden, the Café of São Lázaro, and the masters' studios became simultaneous spaces of transference and reciprocity. By virtue of *"learning by doing"* (L.Carvalho 2019, personal communication, 31 January), the school stimulated the act of thinking.

The prevailing sense of school was particular. *"Open-door"* classrooms invited entry and participation from outside, however, despite some receptiveness from the community at large, this was, in practice, limited to a small circuit of participants because of personal and political restrictions. Local references in art, including the artists based in ESBAP, were the only sources of orientation for students, since access to relevant international media and individuals was poor. The result was paradoxical — on the one hand creating a considerable distance between masters and apprentice, but on the other, nurturing an ideological proximity.

Three major areas, Painting, Sculpture and Architecture, started as one in the first year, only to branch out and then come together, again, in the final year. Such contamination allowed an exchange of

knowledge and experiences between the students and teachers, and deeply influenced the life and work of these artists.

In terms of preparing for a career in art education, the artists, as recent graduates, relied on learnings from their experiences as students, and they either reproduced the good practices that they had observed or counteracted the methods they considered dysfunctional. External support was limited to a visit to the humanities faculty at the university or a senior teacher who would occasionally show interest or concern.

Most of the artists and teachers interviewed spoke about experiencing 'sterile' classrooms as students, and how they sought to learn from the flaws which they had identified in their teachers. They implemented these learnings towards developing their personal approaches to teaching, and suggested changes to ongoing practices whenever possible.

As iterated before, this distinguished group brought paradigm changes to the practice of teaching art and design in Portugal. Each contributed a unique dimension to the process during the course of their engagement: Lima de Carvalho's transition from Art mastery to professorship; Carlos Carreiro's nurturing of conducive interpersonal relationships within classrooms; and Mário Américo's attention to individual needs of students that did not undermine, in any way, his iconic status, and his vision towards the advancement of graphic arts education which sensitized artists to the concept of design. This contributed greatly to the implementation of design as a discipline at ESBAP in 1976, placing Armando Alves as one of the foremost proponents of design in Portugal.

The advent of digital media did not come as a hindrance to the safeguarding and active dissemination of knowledge for this pioneering generation. In light of their historical adaptiveness, new methods and devices were adopted without much repression, at times with the help of younger assistants as in the case of Armando Alves. In some cases, certain manual practices were persevered with in the interest of preservation.

It is thus hypothesized that the key to reinventing the role of each of these artists in contemporary times lies in their creative drive. This neuralgic point is common to all participants, and has allowed them to constantly re-adapt and re-apply their knowledge in a diverse set of areas. The personal or professional pleasure or conflict which they found in their vocation during the act of creating and transferring knowledge, is at the root of their intellectual wealth, and continue to motivate them.

Armando Alves maintains his connection with the academy through keeping in regular touch with former colleagues such as Jorge Pinheiro, or though invitations from the faculty to develop art or design projects. Additionally, the Cooperativa Árvore is an initiative through which students can meet and exchange notes and queries with him. Isabel Cabral maintains an art gallery with Rodrigo Cabral, which allows her constant visibility and means to disseminate her work. She also is regularly invited by the faculty for jury work related to masters and doctoral theses. Elvira Leite is currently a consultant for the Portugal dos Pequenitos Education Service. She seeks to establish this space as an educational one, moving from memorial to real, as a space that represents gaps in the history of Portugal that are fundamental to the construction of its future.

Although most are retired or of retirement age, they remain active, and in harmony with art. Some are still active in education, such as José Paiva and Manuela Bronze; others like João Machado, Mário Américo, Carlos Barreira, Carlos Marques, Armando Alves, Graça Morais, Isabel Cabral and Lima de Carvalho run their studios, many of which are cult spaces where they continue with creative production; while some others like Carlos Marques, Lima de Carvalho, and Elvira Leite maintain administrative or consultancy positions in educational institutions, foundations, and educational services.

For the generation, teaching is/was an interface for their creative drive, and a dominant factor for fulfilment gained through contact with process and techniques, and through interpersonal relationships at both emotional and intellectual levels. The constant contribution of colleagues — older/younger, Portuguese/international, students from different generations, and the individual ethos of all the various schools in which they taught, allowed constant updating and renewal of knowledge.

Their testimonies forward the hypothesis that the continuous dedication to teaching, either in alternate phases or in parallel to their personal work, allowed constant adaptation and preservation of the artists' expertise. The inscription and legitimization of this knowledge has the potential to contribute greatly to the understanding of the involved depth and evolution of the respective disciplines, from both local and global points of view.

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How can Social and Environmental Disclosures affect Corporate Reputation in new and Classic Business Models?

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1. INTRODUCTION

For new and classic business models, intangible assets take a key place. Proof of this is the report called The Brand Finance Global Intangible Finance Tracker (GIFT^{tm}) (Brand Finance, 2018), which states that 52% of the market value of the firms analyzed obeys their intangible assets, bringing forward attention to their relevance for the valuation of any kind of business model, a trend that has been maintained in its different editions.

All intangible assets are relevant but attention has been focused especially on corporate reputation for some time as, within this kind of elements, many authors consider it as the main intangible asset (see for example the seminal paper of Hall, 1992). Its value is incalculable as a differentiation strategy in the market, as it is considered responsible for creating barriers to market access in the sense proposed by Porter (1982), organization 'favourability' defined by Lee and Roh (2012), or for Varey (2013) as an indicator of credibility and confidence. Likewise, it has been shown that a good reputation increases the confidence of potential customers in the products and services of the firm while acting as an advertising demand in the purchase decision (Fombrun and van Riel, 1997). There are also advantages in relation to employees; they want to work in enterprises with an excellent reputation, while businesses find it easier to keep their competent employees (Roberts and Dowling, 2002). Finally, there are financial reasons such as lower risk than similar enterprises that lack a consolidated reputation, which determines a reduction in the associated capital cost and an increase in the market value (Fombrun, 1996; Roberts and Dowling, 2002; Riel, 2013) as well as lower contractual costs with governments, suppliers and other minority stakeholders (Liston-Heyes and Ceton, 2009).

However, there are no recipes or exact formulas on how to improve and/or create corporate reputation by understanding it as a collective perception of different stakeholders. The most that has been achieved is to identify behaviors with which their improvement seems to be linked. Among them, non-financial reporting stands out as a tool to manage reputation from the managerial point of view. It is for this reason that an important field of study within the literature on reputation focuses on the relationship between it and the policy of voluntary disclosure, trying to provide empirical evidence to corroborate it. There is discussed among researchers in this field as to whether a relevant, complete and timely policy of disclosure of non-financial information could have the final effect of improving corporate reputation.

Specifically, within the different items of voluntary disclosure, information of a social and environmental nature, the so-called SED (Social and Environmental Disclosures) has priority. While it is true that the disclosure of environmental performance has been addressed in the early stages, to justify "the visibility of companies"; in recent years and following Qiu et al. (2016) social disclosure offers even more conclusive results.

We will focus on the case of the SED and we will analyze the previous evidence found by researchers in this field about its role in the construction/improvement of corporate reputation. The results obtained have been inconclusive on the SED-reputation relationship, on its causality and even on whether this is a linear relationship. For these reasons, our study aims to synthesize the main achieved results by also incorporating a summary of all possible limitations detected in previous contributions (especially those

related to the longitudinal approach and the incorporation of untreated variables and new measures for these variables) that lay the foundations for further research in this field.

To achieve our research objective, a theoretical review was carried out that will allow us to obtain information on the following three questions: the SED-reputation relationship in terms of its meaning, in terms of its direction of causation and, finally, the gaps detected in the research. To this end, the main publications of the accounting field, high impact journals indexed in the Web of Science (WOS) were reviewed, performing a keyword search during the years 2010-2018 that includes the following terms: social disclosures, environmental disclosures, SED, corporate reputation and performance.

The main advances found on the SED-reputation relationship in previous studies can be summarized in the following aspects. Regarding social disclosures, a greater interest has been found in studying the amount of disclosed information, especially through content analysis and both in annual reports and in independent reports specific to this topic. Its relationship with corporate reputation is also analyzed with a mostly positive sense as well as with other structural variables such as the kind of company, country and size, e.g. in comparative terms, quality appears from a more residual point of view in studies, all of them more recent, and with concern for guaranteeing the its relevance and reliability. In the environmental field, the literature has found that one main reason for making these disclosures has to do with the desire of firms to legitimize themselves, especially those in environmentally sensitive sectors. However, one an important question remains open after reviewing the literature on this subject; that is, if revelation directs reputation or if the direction is the opposite.

The structure of the present research is based on a review of the state of the art, differentiating the contributions that consider only the social disclosures from those which focus exclusively on the environmental field. Next, the conflict of causality that some authors have exposed will be presented. We will finish by dedicating a section to the discussion of the results obtained as well as the identification of the gaps detected that would justify the opening of future research lines to follow.

2. METHODOLOGICAL DESIGN

Analysing whether or not SED leads to better reputation is a topic that is extensively addressed by accounting research. Proof of this is that there were a total of 53 studies reviewed for the 2010-2018 period. To obtain the sample of articles used, the Web of Science (WOS) database, which collects high-prestige indexed publications, was searched. In the initial sample, 213 papers related to the keywords used individually were obtained, although the research team filtered these papers into those that focused on the SED-Reputation relationship in a more specific way. This corresponded to a total of 53 studies related to the subject, with a citation average of 10.36 and an H-index of 13, as can be seen in Figure 1.

Fig. 1 Appointment report
Source: WOS (accessed February 2019)

All these articles were reviewed by the research team and assigned to three blocks: the sign of the relationship SED-reputation; those specific to the environmental reporting-reputation relationship and the direction of causality between both variables. All of them commented on the following sections.

3. SED-REPUTATION RELATIONSHIP: SIGN

There is a wide literature focused on highlighting the relationship between SED and corporate reputation. Although, SED can be classified in two dimensions: environmental or social disclosures in a specific way, which takes us to the following epigraphs.

3.1. SOCIAL DISCLOSURES AND CORPORATE REPUTATION

In this section, we will focus on characterizing the block of social content exclusively and its relationship with corporate reputation.

3.1.1. Theoretical framework: Stakeholders Theory and Legitimacy Theory

Stakeholder theory has been a dominant paradigm in social disclosure and in the social disclosure-reputation relationship. This theory identifies the groups of people who are interested in the company and provides a vision of the general interests of all these groups involved in the organization (Baraibar-Díez and Luna, 2018). Thus, numerous studies highlight the importance of directing social outreach to stakeholders to meet their demands and thus increase the reputation of companies [Gavana et al. (2018), Carini et al. (2017), Dyduch and Krasodmska (2017), Pérez et al. (2017), Lu et al. (2015), Da costa et al. (2014), among others]. However, according to Axjonow (2018) the disclosure of social information is not positively associated with the reputation of non-professional stakeholders, but is comparatively better valued by professionals.

Also widely studied, in addition, is the legitimacy theory approach, which justifies that revealing social information has to do with the idea of legitimacy as viewed by society. Li et al. (2018)

conclude after conducting a content analysis that the levels of legitimacy explain the changes in the volume of the disclosed social information, and that the fact that these companies had labour conflicts or incidents related to workers' welfare and safety negatively affecting their reputation. For Baraibar-Diez and Luna (2018), transparency is a mediating variable in the relationship between disclosure of social and reputation of the companies studied, which improves the effectiveness of the behavior of these companies and their legitimacy. Another way of interpreting legitimacy and its relation to reputation can be through certifications. Such is the case of Carini et al. (2017), who conclude that companies that are certified as socially responsible will have a better reputation. Dawkins and Fraas (2013) emphasize that the strongest companies will be those that disclose more social information and present higher levels of legitimacy.

3.1.2. Measurement of social disclosures

If we focus on the measurement of social disclosure, we can detect that three types of methodologies are used, mostly following Galant and Cádez (2017): the construction of a reputation index, content analysis and the completion of questionnaires. In the opinion of Galant and Cádez (2017), the most widely used method to measure social outreach is the construction of a reputation index such as the MSC KLD 400 social index, the Fortune Magazine Reputation Index, the Dow Jones Sustainability Index and the Vigeo Index. Several of these reputation rankings can also be combined to create another index, as in Carini et al. (2017), by creating an index of social disclosure through the intersection of three indices: the FTSE4Good Index, the World Domain Dow Jones Sustainability Index and the Domini 400 Social Index.

The second method most used by researchers to measure social disclosure is content analysis. In this method, some items related to social disclosure are selected and a dummy variable verifies if they are present in the reports analyzed in each case. Thus, Bansal et al. (2018) perform a content analysis to measure social disclosure in independent reports, distinguishing two variables: comparability and usefulness of the disclosed information. On the other hand, other authors opted to use the indicators of the Global Reporting Initiative (GRI) to carry out the content analysis [Gavana et al. (2018), Da Costa et al. (2014) and Michelon (2011)]. Pérez et al. (2017) and Pérez and García-De los Salmones (2015) also use the opinion of the experts in the selection of items. Ringham and Miles (2018), on the other hand, carry out a content analysis with the objective of analysing the limits of social disclosure, distinguishing three kinds of purposes: those related to reputation management, ownership and control, and responsibility. They emphasize that the purposes related to the management of reputation such as the achievement of competitive advantage in the market, attending to the concerns of the stakeholders or the expectations of the industry, among others, are the most reduced. Patten and Zhao (2014), meanwhile, identify five social areas in their reports: the environment, human resources, the supply chain, community and others.

The third method highlighted by Galant and Cádez (2017) to measure social disclosures is by carrying out a questionnaire or a survey on social issues of the company. Specifically, they consider that this method will be used in the case of firms that are not qualified by a rating agency or in those in which the corporate reports are not available or are not sufficient to carry out an analysis of relevant content. They depend on conducting interviews or sending questionnaires to well-informed people about the social issues of the companies.

3.1.3. Influence of the type of report

Social disclosure can be carried out in companies using various reports, among which are the issuance of independent reports and the so-called stand-alone reports. In view of this, several researchers have intended to analyze the relationship that exists between the disclosure of independent reports that contain social information and the reputation of companies. Axjonow (2018) analyzes this relationship, distinguishing between professional and non-professional stakeholders, and highlights the positive relationship only for professional stakeholders. Bansal et al. (2018) also highlight that the issuance of this type of report is closely related to the reputation of the company. In a more specific way, Baraibar-Diez and Luna (2018) consider that the disclosure of social information in independent, standardized and audited reports will positively influence their effectiveness and the reputation of companies, acting as a mediator in this relationship. Focusing on Italian listed companies, Gavana et al. (2018) also conclude that the disclosure of social information in independent reports is positively related to the reputation of such companies, as do Patten and Zhao (2014) for the case of the US retail industry. In addition, Lu et al. (2015) not only focus on analysing this relationship but also add the quality of this social information. In fact, the positive relationship between the quality of the social information disclosed in the independent reports and the reputation of the companies is pointed out, an issue to which we will dedicate a subsequent section.

However, the relationship between social disclosure and reputation is also studied via an analysis of other types of reports. Such is the case of Dyduch and Krasodomska (2017), who highlight the positive relationship between social disclosure in annual reports and integrated reports and the reputation of the Polish companies they analyze. Dawkins and Fraas (2013), meanwhile, focus solely on annual reports to highlight the positive relationship between social disclosure and reputation. In addition, Valenzuela et al. (2015) study the relationship between social disclosure and reputation, adding the disclosure of information in annual reports, websites, media and social networks through content analysis and highlight the positive relationship. Another study that combines different reports is carried out by Michelon (2011), who jointly analyzes annual reports and stand-alone reports to highlight that social disclosure is driven by reputation.

3.1.4. Influence of structural variables

The influence of certain structural variables on social disclosure, reputation and the relationship between both is the central study of this section. Thus, size has been widely studied in relation to the amount of social information disclosed. We highlight studies that analyze the positive influence of the size of the firm on the level of social disclosure and the firm's reputation, through the contrast of hypotheses such as that of Lu et al. (2015) or Baraibar-Dies and Luna (2018). However, we detected that authors such as Dyduch and Krasodomska (2017), Cho et al. (2015) and Michelon (2011) establish the same kind of positive relationship between the size of the enterprise and the disclosure of corporate social responsibility, without analysing the effect of size on reputation. Sethi et al. (2017) clarify this relationship and focus on demonstrating that size affects the guarantee of the integrity of corporate social responsibility information. On the other hand, in the opposite direction to the mentioned one, Carini et al. (2017) highlight the positive relationship between the disclosure of corporate social responsibility and the size of the firm. To all this we must add that authors such as Axjonow (2018), Bansal et al. (2018), Dawkins and Fraas (2013), Gavana et al. (2018), Laskar and Maji (2018), Patten and Zhao (2014),

Pérez et al. (2017) and Pérez and García de los Salmones (2015) use size as a variable that controls the analyzes they carry out.

In addition, the influence of the board of directors and its characteristics are highlighted by Bansal et al. (2018) who conclude its positive sense in the social disclosure-reputation relationship. Guerrero-Villegas et al. (2018) recently highlighted that management attributes such as independence, size and presence of women are positively related to the dissemination of social information and, consequently, to an improvement in the reputation of the firms, although they do not conclude any kind of relationship for CEO duality. On the contrary, Lu et al. (2015) measure the attributes of the board of directors through CEO/president duality and observe a negative relationship with the reputation of these enterprises.

Another structural variable analyzed in the literature has been the type of company that can have a positive effect on the relationship between social disclosure and reputation. Thus, Bansal et al. (2018) consider that family businesses reduce the possibility of receiving misleading information and, consequently, managers' concern about reputational risk. Gavana et al. (2018) also make a comparative study of the case of relatives vs. non-relatives and find that the former are more aware of all the activities that benefit society, which is positively related to the reputation of these companies. We should point out, however, that most of the studies analyzed in the review of the literature focus on companies listed on different stock exchanges [Bansal et al. (2018), Baraibar-Diez and Luna (2018), Gavana et al. (2018), Dyduch and Krasodmska (2017), Valenzuela et al. (2015) and Michelon (2011)].

Finally, another structural variable with which social disclosure is related is the country of origin of the firms studied. Thus, after reviewing the literature, we detected a predominance of studies that analyze the relationship between social disclosure and reputation in European and Anglo-Saxon countries, such as Carini et al.'s (2017) study which focused on the European Union and the United States and Michelon's (2011), on Europe, the United Kingdom and America. There are also studies that analyze this aspect in Asian countries such as Bansal et al. (2018), Laskar and Maji (2018), Li et al. (2018) and Lu et al. (2015). Focusing on emerging countries, we find studies such as those of Ringham and Miles (2018), Dyduch and Krasodomska (2017), Valenzuela et al. (2015) and Da Costa et al. (2014). Axjonow (2018) and Patten and Zhao (2014), on the other hand, analyze only the relationship between social disclosure and reputation in the United States and Baraibar-Díez and Luna (2018), Pérez et al. (2017) and Pérez and García-De los Salmones (2015) chose the Spanish level. Most striking is the opinion of Michelon (2011), who highlights that the level of social disclosure depends on the country in which the information is disseminated, finding significant differences between the disclosures of Europe and America.

3.1.5. Quality and social disclosures

The study of the quality of SED can be placed in recent research. Regarding the quality of SED, some authors have analyzed its relevance and reliability as being fundamental requirements to ascertain its presence.

On the one hand, Habek and Wolniak (2016b) found that SED relevance is greater than its credibility in several European Union countries. Besides, the follow-up of a Social Responsibility plan and the presence of a Social Responsibility Committee as well as the firm's follow-up of strategies based on the Social Responsibility will contribute to improving the quality of the SED, according to the opinion of authors such as Adams (2017), Dias et al. (2017), Latridis (2013), Amran et al. (2014), and Brammer and Pavellin (2008), among others. In addition, the achievement by a company of any kind of awards related to its Social Responsibility is also

indicative of the quality of SED. Such are the findings of authors such as Sadou et al. (2017), who highlight that obtaining an award related to its SED can be significant in determining the scope and quality of the disclosures.

On the other hand, there are numerous studies for which a reliability indicator is the follow-up of any Social Responsibility standard or guideline. Among the most recognized, we highlight the role of the GRI guidelines studied, among others, by authors such as Lu et al. (2015), Latridis (2013), Wijesinghe (2012), Clarkson et al. (2011, 2008) and Ortas et al. (2015), as examples. These standards guide the publication of social and environmental reports and add value to the information disclosed by applying fundamentals based on economic, social and environmental issues. The existence of an Audit Committee in organizations that disclose this kind of information may also be related to its quality, as interpreted by Al-Shaer et al. (2017), Latridis (2013) and Brammer and Pavelin (2008). According to these authors, the association between these two variables is positive or, as Habek and Wolniak (2016a) concluded, an externally check of SED is associated with quality of information. Moreover, quality is associated with the data and details offered for the items included in SED; the greater the breakdown, the greater the quality detail.

3.2. ENVIRONMENTAL DISCLOSURES AND CORPORATE REPUTATION

Environmental disclosure has much to do with the desire of companies to avoid penalties by society against irresponsible behaviors. A clear example is offered by Mitali and Sumit (2017), stating that BP's performance in the Gulf of Mexico crisis can be explained under a strategy to improve its reputation in the face of the incident. Thus, an important topic of study in this part is the so-called "halo effect" which means that environmental reporting can produce a reduction of potential negativity caused by the damages to the firm when working on corporate reputation. Nevertheless, this effect has recently been qualified by Cooper et al. (2018: 227), who have alternative findings. They claim that the role of GHG emissions in companies with a good reputation is superior, and therefore, these disclosures do not unfailingly protect the company as “the higher the firms’ CSR score, the greater the negative impact of GHG emissions on firm value”.

For a significant number of studies, it is stated that in environmentally sensitive sectors and industries, the reporting of this information has been used as a means of legitimation. Thus, Legitimacy Theory has been widely used as a theoretical framework that justifies the disclosure of environmental information. Cormier and Magnan (2015) find that this kind of reporting has an impact on financial analysts who use this information as a way of legitimating and affecting their earnings forecasts in more environmentally sensitive industries and for companies with environmental performance relative to their industry. Moreira et al. (2014) also use this theory to analyze from a qualitative point of view the role of socio-environmental disclosure in electric companies, which are included within the commented sensitive group of industries. Their results, under a qualitative methodology, show that when the decision to reveal socio-environmental information is made, the main motivations are related to the objective of pursuing a better image and reputation. Also, in China and in a comparative study with Malaysia, Hu and Karbhari (2015) come to the same conclusions in these countries. Thus the dominant incentive to make corporate environmental disclosures in emerging countries is to appear reputable and alter public perceptions about the legitimacy of an organization. For Momin et al. (2017), GHG emissions are commented on by Chinese companies in the management of their organization reputation and business risks, not in a sense of legitimating as the theory proposes.

On the other hand, the theory of voluntary disclosure, that is, justifying environmental disclosure according to its effect on differentiation, states that enterprises with superior environmental performance will have incentives to disclose in order to differentiate themselves. This approach is used by Pineiro-Chousa et al. (2017) to justify the role of environment reporting as a moderator in the relationship between environment management risk and reputation and thought different scenarios: voluntary, mandatory and audited disclosure. It is not only what is revealed that is analyzed but also its quality. Odriozola and Baraibar-Diez (2017), in the context of social, environmental and governance (ESG) disclosures, found that the quality of sustainability reports influences corporate reputation. This introduces an additional variable into the study of this kind of reporting. Other studies such as Jo et al. (2015) find that the reduction of environmental costs translates into an improvement in the results of these enterprises (return of assets),even though there is a delay of one or two years.

Finally, in relation to environmental reporting, we must indicate that there are some studies that deal with this issue. Shan et al. (2018) focus on the field of social media to find that they are used for environmental reporting when environmental incidents occur. That is, they are being used to give more information that focuses attention by creating public opinion; all this in China, which its authors qualify as having "poor" environmental reporting.

3.3. SED-CORPORATE REPUTATION CAUSALITY

Causality problems are also raised in this SED-reputation relationship, and the results seem to accept that reputation leads to disclose but, at the same time, that disclosure affects reputation. Brammer and Pavellin (2008, 2006) claim this issue is still open and Brooks and Oikonomou (2018) confirm such evidence in a recent literature review paper published in *The British Accounting Review.*

After reviewing the papers involved in studying SED-reputation causality, we must point out that most of them justify that reputation is positively associated with higher levels of disclosure, with analysis under different approaches. Axjonow (2018) uses regression analysis, which allows her to conclude that disclosure of social information positively influences reputation, understood in terms of two variables: the disclosure of social information following GRI guidelines and another variable called CSR Report, which is an average of the environmental, social, government and economic score provided by the Thomson Reuter's ASSET 4 database. Pérez and García-De los Salmones (2015) conclude that it is positively related to reputation whenever stakeholders are treated in a responsible manner and, consequently, can improve the efficiency of companies and strengthen their strategic positioning. In this positive point of view about the SED-reputation relationship, Baraibar-Diez and Luna (2018) developed a structural equations model to define the causal relationship between social disclosure, reputation and transparency that corroborated that social disclosure improves reputation, while transparency is the mediating variable in this positive relationship.

From the opposite point of view, De la Cuesta and Valor (2013) present reputation management as a powerful driver for improving quality of social, environmental and governance reporting because industries with a high level of reputation risks have the highest levels of disclosures. Besides, this study found an isomorphism effect among companies within the same industry. Da Costa et al. (2014) conclude that reputation influences the disclosure of sustainability carried out by Brazilian firms analyzed in their independent reports. Luna and Fernández (2010) consider analysing whether there are differences between the social reporting of multinationals when they address national and international audiences. Among their results, they find that the level of reputation and exposure

of these enterprises justifies greater social reporting. They also analyze the differences between enterprises with a reputation in sustainability issues and without it. Da Costa et al. (2014), find the existence of significant differences that justify that the former achieve better results through a higher valuation in the market by their investors while presenting a lower variability of their cash-flows, which leads to considering reputation as an incentive to disclose socio-environmental information. With the same objective, Michelon et al. (2011) also highlight that SED is driven by the reputation of the companies that make up the Dow Jones Index. However, they clarify that there are differences in the SED of the countries of Europe and America due to the social and environmental impacts of the firms in each country. Finally, Dyduch and Krasodomska (2017) also focus on highlighting the positive relationship between reputation and social disclosure in annual reports, which in turn is determined by two proxies: the inclusion in the Respect Index with which it is positively related, and the duration of the listing on the stock exchange with which it is negatively related.

4. CONCLUSIONS, GAPS AND FUTURE LINES OF RESEARCH

The objective of our study was to conduct a literature review of the SED-reputation relationship, detailing the limitations found in these previous studies with the aim of filling unsettled research gaps. This review was conducted in the period 2000-2018, analysing the main high-impact journals that make up the WOS with papers on this topic being detected by keyword search. In this way, 53 papers were analyzed, which can be considered a relevant contribution in the study of the SED-reputation relationship and its causality.

The main results of our theoretical review focus on highlighting the positive relationship between SED and reputation as well as different benefits of SED where the improvement of corporate reputation is always included. That is, there is a positive relationship between these variables, regardless of their role as cause or consequence, respectively. This is a first future line of research to which researchers should pay special attention; however, it is not the only gap detected. Thus, as a second line of study, we should highlight the possibility of looking for other high-end ways to measure SED, for example through the elaboration of surveys among specialized stakeholders and not only through the assessment of the action taken by the company, that is, taking into account its impact on different interest groups. Another important research gap, the third proposal, has to do with the fact that this relationship could also be analyzed by other dimensions that are not structural or even consider non-financial or qualitative variables in a future analysis. The majority use of quantitative variables vs. qualitative-qualitative variables. This leads us to suggest new and more complex measures based on second order constructs in order to measure SED and reputation in a more effective way. Specifically, for the first SED variable, another future line of research could be to study the quality of SED along with quantity, incorporating this dimension into the analysis of SED in line with the most recent studies. Finally, it has been observed that longitudinal studies with wide horizons are the major abstractions within this topic, which leads us to propose their realization in order to verify the role of reputation as an intangible asset and the need for a long-term horizon for its creation. This is the last line of research we propose.

To conclude, and as the main limitations detected, the period considered from 2000 to 2018 can be extended to provide a broader view of the SED-reputation relationship. In addition, our analysis focused on journals in the Journal Citation Report and other specifics journals, which may be a limitation that could be amended by expanding the range of journals analyzed.

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A Study on Digital Culture Phenomena in Addressing Cyber Threats

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INTRODUCTION

Spending time in online/digital/electronic information society becomes more diverse and attractive activity. From being limited to just leisure, art, education and communication, in the last 20 years digital culture has become an essential part of digital economy and business, e-government and online services, without which the entire social system would have already been in a state of dysfunction. A person living in times of Internet would see a gap in the electronic environment as something undermining foundations of his or her existence. Philosophic, anthropologic, social and existential problems, when speaking of electronic culture and digital society itself, have become a research target in the last 20 years, and every year since, these topics grow more complex. This article is aimed at conducting axiological analysis of digital culture (online-, cyber-, electronic culture) and describing the destructive cyber influence which severely affects values, life purposes, attitude to life and death, etc.

The study of the factor of cyber threats and cyber-influence in the philosophical and humanitarian sciences is relatively recent, compared with the study of the problems of information protection and issues of national security. The actualization of these problems is due to the process of self-organization of destructive virtual groups that promote aggression and suicide, which has become a kind of trend in online culture. With the development of virtual communication and the development of electronic (online, digital) culture, there was a variety of risk factors for human security. One of the first drew attention to online gaming addiction, the study of which has been conducted since the 80-ies of the last century and has been associated with both social and medical aspects.

Various forms of manipulative influence on a person aimed at involvement in extremist associations are actively studied in science, which is connected, first of all, with the issues of state and national security. More recently (since 2015), attention has been drawn to the problems of involving adolescent and youth audiences in communities that have a destructive and suicidal orientation, aimed at committing real crimes or suicides. However, this issue has not yet received wide scientific discussion. This theme refers to the more general problems of virtualization of the modern way of life, the development of electronic culture and its forms, their impact on the worldview and human behavior.

Most modern and developed countries have already faced certain consequences of the virtualization of culture and interpersonal communication. Along with the improvement of living standards and significant breakthroughs in medicine, electronics and robotics, there are new deviations associated with the deformation of relations between a human and the world, super-valuable attitude to the virtual environment and communication, increasing human alienation in the real world. The european countries, the USA, Japan, China and Russia have already faced the phenomena of "escape from reality" associated with Internet culture (dependent gamers, hikkikomori, etc.), the increasing number of teenage and youth suicides, outbreaks of uncontrolled aggression, withdrawal to virtual worlds, increased dependence on gadgets and online presence in virtual reality, which is now called one of the threats to modernized cultures and existential security. Virtual communities promoting murder or suicide have become the most dangerous for human life and health. In recent years, the most famous and dangerous among them were "Blue whales" and "Columbiners", which will be the subject of our study. So-called "Columbine communities" promote copycat crimes at educational institutions being inspired by the Columbine High School massacre in 1999. Global disseminating of such communities has led to their being broadly promoted on the Internet which resulted in tragic consequences in real life.

LITERATURE REVIEW AND METHODS

In the methodological aspect, two considerable groups of sources should be noted which affect this research, namely, the theories on the problems of the information age, e-culture and the research of the Internet impact and cyber-threats to a person in the information environment.

Pioneering academic and board centers in different countries have been studying the influence of IT penetration to different sociological cultural processes. As an example, issues of electronic culture development are studied by researchers of the University of Milan (A. Ronchi, 2009); McLuhan Institute (Virtual Maastricht McLuhan Institute (VMMI), the Netherlands (K. Veltman, 2004). Ethical and anthropological issues of the information area are addressed by researchers of the International Centre for Innovation in Education (ICIE) Karlsruhe, Germany (R. Capurro, 2006); London School of Economics, department of Media and Communication (Great Britain) (L. Haddon, 2004); Centre for Computing and Social Responsibility (De Montfort University, Great Britain) (S. Rogerson, 1998); Center for the Study of the Information Society of the University of Haifa, Israel (D.R. Raban, 2009); ethical, political and legal aspects of IT penetration are surveyed by L. Rocci (2012); B. J. Kallenberg (2001), C.L. Chang (2011) et al.

Such humanities scholars as J. Baudrillard (1994), P. Virilio (1984), B. Heller (2012), M. Heim, (1993), B., Girard, S. Siochru (2003) and P.C. Rivoltella (2008) studied influence of e-culture (digital culture) on human values, on a single person, on lifestyle and also emerging risks. Harvard University professor L. Floridi (2013) conducted a study on philosophy of information and ethical issues of using information technology. A. Duff (2008), professor of the Open University in London, considered ethical issues of the Internet development and addressed the issues of copyright, digital inequality and violations of right to private life. F. Schäfer (2009), E. Castronova (2005) et al. researched existential issues and risks in the information society and cyber culture development. These problems were also raised in our earlier studies related to existential ethical and anthropological aspects of the electronic and media culture development.

J.Baudrillard most thoroughly explored the essence of the human entry into the virtual culture. He determined the ontologic status of the simulation in terms of the formation of the “hyper-reality”, absorbing and eliminating the reality (Baudrillard, 2000). Study of IT security attracts increasing attention as new phenomena and processes of e-culture evolve. Their foundations were laid in the theories of the information society, establishment hereof has been started at the end of the last century in the proceedings by J. Masuda, D. Bell, A. Toffler, M. Castells, M. McLuhan, J. Nasbit and others, and has been continued in the works by both modern Russian and foreign researchers. The studies by M. Castells (Castells, 1997) and M. McLuhan (McLuhan, M., & Powers, 1989) on the issues of informatization of culture and communication were the most important for understanding of culture and IT society rules. Our study will be carried out from the standpoint of socio-cultural and axiological approaches, which allows to reveal the risks and drivers for evolution of new forms of communication for a person, his rights, values, and cultural system in general. Along with it, we will keep on developing a theory of e-culture (herein regarding it from the point of cultural security) that we have studied over recent years and have presented in a series of articles and encyclopedic publications.

The novelty of the approach suggested consists in investigating a phenomenon of security in the information society from the position of reference to the development of e-culture and various demonstrations hereof. E-culture in the most general sense is understood as an area of human activity and results hereof related to the production of digital objects and phenomena, simulations of living culture objects, virtual spaces, processes and phenomena developed with the help of information technologies.

Another methodologically important rationale for our study is a theory of security in axiological interpretation. In terms of the modern global open world we consider security as one of the main values of the individual and society, object of protection, security and research. First of all, we are talking about protection from unlawful and manipulative info-psychological impact made on a modern man by different sources. Security herein is connected with protection from possible distortions of social and cultural systems resulting in damage to person's health, life, rights, and freedom due to info-psychological impact with the use of modern electronic resources. Negative impact of information content is bound with the fact that it causes psycho-emotional and socio-psychological tension, distortion of moral criteria and rules.

RESULTS

Digital culture and human existence

Digital culture or e-culture is first of all a new area of human activity dealing with creation of electronic copies of non-physical and material objects, as well as with creation of virtual objects of science, communication and art. Digital culture was first mentioned in late 1990s. According to the European tradition, digital culture was originally understood as a form of cultural heritage preservation (Ronchi 2009) and also as opposition to e-commerce. Later, the term was used to refer to different objects having electronic or other digital form. Nowadays, the "digital culture" is an interdisciplinary concept functioning in Philosophy, Cultural Studies, Sociology, Education, Political Science, Economics and definitely in the field of Information Technologies. It both approaches and is approached by scientists, programmers, artists, mass media workers and average information systems users who all elaborate electronic forms of self-representation and self-manifestation in the global network by the means of technologies. The most important characteristics of digital culture are transparency, integrity and availability for every user. Moreover, everybody can become both a user and a creator of this phenomenon, having creative freedom and not being tied to strict limitations (Baeva, 2014).

In general, the digital culture represents cumulative results of people's creative activity and communication by the use of the IT. It is marked by its taking place in a free information area, by its digital form, remote technology and liberal nature of its content. The distinctive features of e-culture are its digital essence, virtual nature, freedom of access, openness to the members of the "information community" (those who have access to electronic resources); remotability, distance; active behavior in accessing digital data, possibility to develop content from any point of "information area"; liberality, linguistic description, absence of strict rules and standards; dominance of the visual over the conceptional; innovativeness, technocracy and high speed change.

Our study of digital culture focused on a rather new research area that is developing npwadays. It is the theory of existential cyber security addressing philosophical and existential analysis, cyber threat research and destructive cyber influence which severely affects values, life purposes, attitude to life and death, etc. A person's presence in the digital culture builds a synthesis of the existential ("existence in and for oneself") and the transcendent ("existence with and for the Others"). In the electronic culture, a human being re-opens such phenomena and terms connected to his or her existence as "control" and "freedom", "time" and "space", "existence" and "death", "loneliness" and "the Others", "objectivity" and "subjectivity" (Schafer, 2009).

Human beings of e-culture spend the most part of their life in the virtual space, where their work, play, get to know new people, intercommunicate and even bury themselves. In this space personalities transform into a virtual character – an image, created by them to log onto the Internet, where they live in an extremely dynamic sphere, requiring them to apply best efforts and mobilize the strengths and

possibilities that have not been used before. The sphere of the e-culture is a kind of the "second" life, prototype and continuation of the reality and "live culture", where human beings of the pre-digital age searched for the solving of their existential problems: being, death, irrationality, "not freedom" and solitude. The existence of human beings, living in the virtual space, has significant distinctions to the reality: human beings can live and die here many times, choose their presence in the Internetet or ignore it, specify the conditions of their being, imagine their own life story and purposes.

It should be noted, the conditions of e-culture (the existence of human beings "here and now"), where they find their essence, form also new existential problems, challenges, that they had to face for the first time:

- "Irrationality of relationship "virtual I and virtual Other one": In fact, this is a new problem definition of the relationship to Other one, dealing with the communication virtualization, missing of the factor of emotional and personal perception, responsibility, honesty, etc. Under the communication virtualization, the interaction with each part turns into a game, quasi-reality, where individuals realize that, their partners can be "any one", even an answering machine that makes honesty, frankness and trusting absurd.

- "Loss of the reality limits": The issue, related to the double consciousness of a human being, living in two worlds; In this regard, the offline world becomes less important, but the online one, the value of which is growing, remains to be a simulacrum, depriving a human being of "ground".

- "Virtual objectivization": The frontier between individual and community phenomena under e-culture gets less clear. A human being is being involved into the mass more and more and becomes a part of the global network mechanism, conducting the options as many other ones according to the standard developed by a moderator.

- "Freedom of online choice": The integration with their online images, technologization of human beings, results in multi-alternative and pluralistic models of behavior, the moral regulator of which are replaced with anarchy, "instructions" or "game rules"; Ethical choice is extremely hampered and transferred from the sphere of moral appraisal into the sphere of personal and moral self-evaluation in full.

- "Solitude in the Internet": The issue of loss of the interpersonal communication, dipping into the Internet-space, where everybody exists alone with a machine; The alienation of human beings from traditional grounds: nature, family, school, friends, which play less significant role, turning a person into a biosociovirtual "monad".

- "Online not liberty": Within information environment human beings find both new liberties and dependences. The main of them (from e-culture) is the striving to be all the time online, the fear of the reality and interpersonal communication and loss of interest in life. (Baeva, 2017)

The overcoming of the solitude and the insulation of personal existence involve the human possibility of communication and transcendence to other one through love, friendship, empathy and sympathy. E-culture produces new possibilities for the communication of new global type and human interaction without boundaries which have never existed before. Neglecting of the role of online communication and online communities can result in the estrangement of parents from their children, facilitate the breaking off between online and offline relationships, contribute to the extension of crisis of human social identity. It should be pointed out that a large number of people consider the Internet to be an important form of the communication and interaction. The virtualization of the communication sphere

and social interaction is probably an area of the highest risk under the information age that contributes to the changing of personal essence, the forms of experience transfer existing for millenniums, traditions and values.

The shift from the personal communication to the communication mediated by information technologies becomes a new condition of the development of modern human beings, who overcome age-related, psychological and physiological complexes within the communication on the one hand and can get new phobias and fears on the other hand. Thus, modern psychologists diagnosed nomophobia as a social fear of the direct interpersonal communication caused by the habit to use the computer-aided or cellular communication (King 2013).

The interpersonal communication is more replaced by its online simulation, displacing such most important relationship spheres as love and friendship. Modern researchers note that the number of network romantic relations has been increased and virtual relations (called "the Second Life") sometimes can improve the mental state of persons, help to solve their real problems (Golbert 2011). The concept "friendship" is undergoing certain changes under e-culture, dealing with the loss of stability, social and financial support and responsibility (Amichai-Hamburger 2012). The simulation of feelings in these spheres facilitates the loss of human existential grounds and changes moral and ethical milestones related to the understanding of the Other one's value.

In some specified sense, human beings live in two worlds, which they do not trust in full; offline communication remains to be important, although the value of the virtual Other one is developing, the interaction with who has its rules. The logging onto the Internet to "meet" the Other one and transcendenting under these conditions turns out to be insignificant, senseless, as these relationships involve the simulation of feelings, trusting, understanding and participation in the Other one's life.

We will look at virtual communities associated with the highest risks for a person from the standpoint of existential security.

"Death groups" and existential challenges

Basing ourselves on these investigations we aim to study the "death groups" functioning on the Internet ("Blue Whale", "Wake Me Up at 4:20", etc.) which have been attracting significant attention in Russian and international social media since 2015 for causing teenagers to commit suicide and the "Columbine communities" promoting copycat crimes at educational institutions.

Both existential and axiological approaches as well as empirical data analysis (reviewing Internet communities and their websites) will be the basis for this research. By these means risk factors and groups will be detected and characterized as complicated social entities within the online culture. One of the criminal manifestations that have occurred in the digital domain was the emergence of so-called «death groups» whose members are pushed to commit suicide. These groups are focused primarily on adolescents, who are people with as of yet unbalanced minds and who are easily exposed to various influences. Teenage group members make their choices unconsciously, guided by external manipulation and hidden mechanisms of will or mind control. They are usually driven by the desire to experience thrills, extreme entertainment which originates in disappointment in real life. In Russia, such online groups began to spread in the social networks in the period of 2015 and 2016, which has led to a number of investigations, changes in legislation and to introduction tougher punitive measures for bringing a person to suicide doing this via the Internet in particular. Similar communities have also appeared in other countries (including Ukraine, Kazakhstan), although have not expanded that much.

The “death groups” started attracting attention in Russia in 2015. It was after Rina Palenkova, a teenage girl from Siberian city Ussuriysk committed a suicide, she jumped in front of a train on November 22. Just a few minutes before her death she posted her photo with words of farewell on the most popular social networking service in Russia called “VK” (“VKontakte”). Her photo and message quickly became an Internet meme. After Rina’s death, Philipp Lis, who was the administrator of the community named “F57”, who had an intention to gain attention, announced his involvement in this death, as well as in some other teenager suicides. To emphasize his importance to the case, he pointed out link between his group and the groups “Sea of whales” and “Silent house”. There were 8 groups in which the members were asked about the backstory of their death and in those groups suicide was viewed as martyrdom, sacrifice and was glorified. According to some Internet myths, souls of those who passed through suicide allegedly went to the “Silent house” (a meme of online stalking culture denoting the lowest level of the hidden web and a special state of consciousness upon reaching which is impossible to return to the real world), where they could find liberation and peace at the level of digital rebirth. Members of the community were mentally unstable teenagers, whom he pushed to suicide by engaging them in the game. The topic of suicide, which traditionally attracts the attention of young people of a certain psychological type or in crisis situations, has become popular in the social networks. Different Internet communities started ascribing having controlled the behavior of adolescents and having brought them to suicide, to themselves.

The “Death groups” is the name that generally describes online communities where children and teenagers, under the disguise of assigning tasks in a game form, were driven to commit a suicide. Using the game form, the communities day after day made their members to perform more and more difficult tasks, from making scratches in the shape of a whale on their arms (whales are mammals who are known to be able to commit a suicide) to jumping off high-rise buildings and to other forms of suicide. Around 130 children died in this manner in Russia in 2015 and 2016.

During this period, there existed not less than 1,500 groups on VK promoting suicide.

The investigation of 15 children and teenagers’ death cases resulted in that 21-year-old Phillipp Budeykin (a.k.a Lis) who was the administrator of eight “death groups”, the most notorious one being the “Blue Whale” game, was arrested on November 16, 2016. A criminal case was brought in May 2016, after several Russian mass media outlets wrote about so-called “death groups” — numerous communities where young people were encouraged to kill themselves. In 2017 Budeykin was ordered to a penal settlement for 3 years and 4 months according to Article 110 of the Criminal Code, part 3 of article 30, article 110 of the Criminal Code «Inciting to suicide or such an attempt». In May 2017, Budeykin pleaded guilty. The investigation has been currently ongoing in the Krasnodar Krai, the Republics of Komi and Bashkortostan, in Moscow, Volgograd, Voronezh, Tula, Kemerovo, Novosibirsk and the Omsk Oblasts. In 2017, the social network “VK” recorded more than 4,000 groups that promoted suicide. According to Commissioner for Children's Rights in the Russian Federation Anna Kuznetsova, the number of children suicides in 2016 increased by 57% (compared to 2015). Among European countries, Russia has the most numbers of teenage suicides in recent years (Gareth, 2017).

Similar communities started to appear and gain popularity among teenagers («F57», “Wake Me Up at 4.20”, “Sea of Whales”, “Insider”, “Silent House”). Their purpose was foremost that of glorifying of death and suicidal acts. The game combined online and offline levels; virtual tasks were to be performed in real life. As an example, the “Blue whale” game had a special algorithm of actions for a teenager to follow: 1) A teenager was to make a post on his/her page hashtagged #I’m in the game, 2) then he/she were assigned to a curator who gave them tasks, 3) if the task was not carried out, the teenager was threatened with his/her family members to be injured or killed. So each group member was allegedly assigned to a supervisor who ensured the tasks to be fulfilled. The tasks were given on the daily basis; there were 50 of them (it is a reference to the book “50 days before my suicide” by S. Kramer). The first

tasks were that a teenager had to cut him/herself with a razor, to put the image of a whale on his/her hand, and then to take a picture of him/herself standing on the roof edge proving that he/she did it. Then a teenager had to kill an animal and record a video. Most of the teenagers dropped out at that point. The last task was to "relieve the world of his/her presence" by committing a suicide in one form or another (by jumping from the roof or in front of the train, hanging himself or herself, etc.). The average age of the «death groups» members was mainly 10-14 years old. To enhance the impact on the audience, there were used harsh sounds, screams, psychedelic music, videos of death penalties, and other effects, particularly adding up to the general impression at night-time (at 4:20 in the morning). The main memes of the “death groups” are a blue whale, a butterfly (having a lifespan of only 1 day), and “4:20” inscription.

For many teenagers and children, following such groups is perceived as a sort of extreme entertainment. Like everything forbidden, connected with mystery and fear, following such a community looks like a game. Moreover, the tasks themselves are viewed as a quest or a mission. This mechanism is aimed at attracting more and more members for the purpose of participating in group relations. Not all of the teenagers take the game seriously. However, there are still new victims. The “Blue Whale” game used scenarios which are popular among teenagers in cyber games: a multi-level access system, initiation tasks, obtaining sort of a status, using of symbols and signs. But it was not leisure or entertaining game, it was a destructive psychological technology created by those who are competent in matters of self-destruction.

After the scandalous trial, the surge of teenagers’ suicides started to cease, and the “death groups” began to be banned by social networks’ administrators and volunteers (primarily the parents of deceased children).

However, the phenomenon itself hasn’t been eradicated for good. In the last few years a media war between people who promote suicidal communities and those who oppose it, flared up in Russia. According to the «Anti-Blue Whale. We Oppose Deaths» community project the death groups have become increasingly popular yet again since 2017; their activity has shifted to Instagram and Telegram as their public pages on VK were banned. After the notorious «Blue Whale», “Whales’ Sea”, “Wake Me Up at 4.20” groups and other banned ones, the new ones that also combined virtual community and the game form, emerged. In 2017 and 2018, the would-be members had to post a request “I want to play” or “Looking for a curator”. The curators themselves invite the members upon checking their age, whether it is a teenager/child. The members are asked to make a small payment (50 rubles) and then the game begins. A lot of curators are former players who have passed all the levels except the last one and now they coach others. These groups often have drug dealers as members, the curators are recommend to take drugs as to maintain consciousness without sleep. It becomes more and more difficult to track down such curators because they are often former players.

Viral messages about the “Run or Die” game in which children were tasked to cross the road in front of moving vehicles, appeared in February, 2018. In January, 2018, a new game called “24-Hour Disappearance”, that incited children to leave their houses, emerged. This game circulated on “VK”. According to psychologists, information about the suicides committed becomes viral among the young audience and can serve as a catalyst for such further actions. Use of these mass mailing mechanisms in order to attract the teenagers’ attention to the subject of suicide bears destructive influence as of itself. At the same time, we believe that if the threat is hidden and the communities’ administrators do not act directly but through a chain of associations, then there is priming effect that takes place. It consists in that the use of certain signs and memes evokes certain associations in a person’s mind which leads to anxiety and self-destructive tendencies. In this case, the amendments to the Federal Law on immediate blocking of "death groups" adopted in Russia in 2018 are an extremely important step in order to withhold their dissemination and impact on the audience.

Information about the “Blue Whale Challenge” game has spread to different countries. Police in US, UK, New Zealand and Africa warned about its dangers in the media and told that to the student’s parents in schools. For example, the increased percentage of child suicides in India since 2017 has been attributed namely to the “death groups” influence (Srivastava, 2017). In 2018 the Indian law enforcement agencies informed teachers that the teenagers demonstrate high interest in the “Blue Whale” game and, also, in the game called “Momo” which was created for the instant messenger WhatsApp and asked them to increase control over children (Press Trust of India, 05.09.2018).

People who tend to join the “death groups” are at the same risk as the totalitarian cults’ members whose consciousness is highly susceptible to external manipulation. They are usually prone to often suffer from depressions; they have a weak will and lack social support (from friends, trusted people and positive relationships with parents). Another factor intensifying these features is that they go through the crucial period of adolescence. It is when people have a strong sense of loneliness and face misunderstanding on the side of their loved ones. And finally, another important factor contributing to children joining the “death groups" is the tendency to wishing strong emotions, to taking risks, seeking for fresh, thrilling and high-risk sensations (Cuss, 2014).

Regarding the “death groups” (“Blue Whale” and others), we do not just deal with ordinary suicides but with manipulations using certain behavioral blueprints and psychological techniques. In fact, it is a form of hidden violence. Forced suicides derive from different motives, unlike genuine ones. They push to make a pernicious step, to follow other psychological mechanisms. These psychological techniques exploit specific features of adolescence, the youth’s interest in death and mysticism, its high sensitivity, susceptibility to abuse and intimidation, its looking up to an adult friend (curator) and an exceptionally strong desire to be an adult.

The psychological factor also appears to contribute to these at-risk groups. Apart from the social factor, an important role in getting into a high-risk group is played by existential vacuum, lack of meaningful goals and values that help a person survive even in the most unfavorable conditions. How modern youth understands the meaning of life proves to be connected with attention to the self on the Internet, with personal fulfillment, welfare, entertainments and peak experiences that fill the life with striking moments. Formed by advertisers, ideology of consumerism, by digital media environment and virtual communities, these patterns have a decisive impact on young person’s worldview. Neither family and religion nor culture and education can offer a youngster, being in a risk group or “on the verge”, reasons to positively answer to the biggest question of existence: “Is life worth living?” Loss of desire to live and communicate becomes the reason for committing suicides and escaping from the real world into some parallel lives. The most wide-spread topic among youngsters in network communities is disappointment and inability to experience positive emotions. The virtual environment without real emotional bonds built there makes a person face one-on-one such existential problems that cannot be solved where virtual communication prevails. All this contributes to growing pessimism, boredom and apathy which are exactly suicide background factors, for life seems to have no purpose or value.

“Death groups’” administrators utilize such an RPG-like script so as to encourage the game’s participants to complete it like all gamers do, which is a crucial external aspect of the juvenile suicide issue. Manipulating the youth’s behavior and consciousness relates with that juvenile mindset inclines to easily erase borders between a game and reality, between what is allowed and what is forbidden. In addition, the act of romanticizing death and suicide as an action committed by a person who is not afraid to rival the World and to live up the rules of his or her own, is exploited as well. The existential borderline situation, which teenage members of such communities could suffer from, could also cause self-destructing impulses that could result in suicide.

We can state that the nowadays' digital environment is not just a basis for modern communication and society integration of an unbelievable scale but also a place where one can escape social reality, both consciously and unconsciously. It's the ground for new escapist outpourings, for demonstration of refusal to live in the real World. Virtual death communities are the most dangerous escapist manifestations resulting into suicide as a complete refusal to live. Our complicated today's life keeps on constantly putting more pressure on a human being who can either improve his or her abilities to adapt or try to escape from this life.

If the "death groups" are aimed at causing internal destruction, then the "Columbine communities" are aimed at provoking external aggression. Nevertheless, the promoting mechanisms of both types of communities are largely similar, as well as the final output being a suicide.

The Columbine communities

The history of the so-called "Columbiners" traces its roots in the massacre committed by two American teenagers, Eric Harris and Dylan Klebold who initiated a mass shooting in the Columbine high school (Colorado) on April 20, 1999. 13 people were killed, 24 wounded. After the bombs planted in the cafeteria had failed to detonate, they shot students and teachers and after that shot themselves in the school library. Their crime became the source for many subsequent imitations. That were copycat terrorist attacks launched by teenagers in the USA, and then and in other countries. The total number of the Columbine copycat crimes committed in the USA is over 70. One of the most large-scale shootings took place in 2007 when Seung-Hui Cho, a student from South Korea, who was armed with two guns, started fire first in the student dormitory and then in the educational building of the Virginia Tech, killing 32 and injuring more than 25 people. Shooting in the Columbine high school has been studied in detail by both criminologists and experts in the field of psychology, pedagogy and sociology. Particular attention was paid to the study of factors that contributed to the crime of adolescents, including family factors (Mauser, 2012), pressure at school (Papadima, M. (2016), psychological characteristics (Woolley, 2009) commitment to computer shooters, etc.

In 2017 the "Columbine" copycats were actively promoted in Russia in virtual communities on social networks. So, four VK communities ("Eric Harris and Dylan Klebold", "Thia Columbine", "Columbine Edits" and "Stupid Columbine") had altogether around 6.5 thousand members (currently blocked). The group members exchanged advice, expressed their hatred for school, teachers and classmates, discussed weapons and their idols. The groups contained photos and videos of Columbine massacre, the actions of Harris and Klebold were admired, they were viewed as heroes to teenagers who were suffering from what surrounded them and then dared to challenge the society. A shooting game named "Doom" was also popular with the group members, being the one played by Harris and Klebold and having a high level of violence. In many respects, these communities wished to attract attention and find like-minded people feeling similar resentment or hatred. However, the groups' posts were followed by real crimes. In over two years there have been 7 "Columbine" copycat crimes committed in schools and colleges in Russia resulting in 4 to 21 victims. All of them were committed following a similar blueprint of the original crime at the Columbine high school. Promotion of those crimes contributed to the virtual community where the interest for the subject has arisen and even passion.

The Columbine-style copycat crimes are largely associated with their origin, including the cult of violence in the media culture, increased aggressive attitude among young people, affordability of weapons, global availability, craving for attention cultivated in social networks. At the same time, this problem is far from being simple in assessing its sources and identifying triggering mechanisms.

We have built the psychological profile of the Columbine criminals upon researching the youth engaged in vlogging. It proves to much resemble members of the suicidal communities: they are unstable, have weak will, are highly sensitive, show antisocial behavior, uncommunicative, detached, dissatisfied, they feel hatred towards other people and desire to blame others for their own problems. On the one hand, they are the Columbine victims themselves, and yet criminals ultimately ended their lives by suicide. Viewing from the standpoint of psychological forensic evaluation, the Columbine criminals are not tormented victims to circumstances who decided to take revenge, but the most of aggressive and antisocial adolescents. They brought the violent game into the reality and wished to attract maximum attention.

The source of aggression, regarding the priming theory, is negative memories and associations that violent content on the media evoke in a person's mind. Images of violence and aggressive behavior lead to forming a certain type of behavior. These images emerge as a result of a chain reaction the mass media and global communication start. Such reactions can be triggered not only by content picturing real violence, but also by the games which gets an enhanced effect when other unfavorable factors (social, mental, economic, interpersonal) are involved. We define aggression as a motivated intention to harm someone else. L. Berkowitz believes internal reasons for violent acts committed by teenagers to be: gaining pleasure from causing pain to others, from feeling power and control, from possessing power over others; it is desire to assert one's reputation of a "tough guy"; frustration from not achieving one's goals or from not receiving the expected rewards (Berkowitz, 1962). External causes can be related to having experienced violence from parents and others, to having family conflicts, as well as to experiencing the effect of priming, which is a virus of violence unleashed by the media. Berkowitz figured out the effect of mass media in spreading of copycat crimes upon conducting a series of experiments.

Existence in the digital world where a person learns modern values and guidelines, in many ways turns out to be simulative and quasi-real one. This cross-border nature of the digital world is perceived as a norm without clear guidelines. The worldview of a teenager is generated in reality of games, social networks headed by bloggers and the Internet influencers. The simplest ideology — the cult of power — prevails here, along with consumption and savoring. Digital reality, viewed by a teenager as something paramount, forms pluralism, exceeding freedom of actions, impression of everything around being a game, devaluation of real life which also affects the person's attitude towards life and his/her behavior and leads to transgression and erasing the borders between reality and the virtual world.

CONCLUSIONS

Today electronic culture has become not only a stronghold of modern communication, unprecedented integration of society, but also a ground for conscious and unconscious escape from social reality, new manifestations of escapism, rejection of the desire to live in reality. Today electronic culture has become not only a stronghold of modern communication, unprecedented integration of society, but also a ground for conscious and unconscious escape from social reality, new manifestations of escapism, rejection of the desire to live in reality. The electronic environment creates the prerequisites for this, allows you to transform communication, change the nature of sociality, existence and transcendence of man in virtual existence. Existence in the digital world is becoming a new form of being of the individual, which is largely determined by the subject and modeled by him. However, freedom from reality and its objectification can lead a person not only to self-development and creativity, but also to the highest degree of loneliness, digital autism, to strengthen escapism and suicidal aspirations peculiar to existential "border situation".

Serious risks are also connected with the transfer of values in virtual worlds, social networks, which complicates the real communication and the capability to solve vital problems, develops the destructive way of thinking and self-destructive behavior. The dangerous contents of the websites with suicide clubs and so on are the factor that contributes strongly to the self-destructive behavior of the youth. Internet addiction disorder, loss of real vital emotions caused by perception of oneself and his milieu as virtual world characters can be other reasons of such behavior. Interpersonal communication is being replaced by its virtual imitation, such important spheres of relations as love and friendship being ejected also. The spiritual sphere appears to be nowadays the zone of risk. It suffers crisis under conditions of the consumer society and hedonism. As the consequence of the humanistic knowledge crisis the liberalization of morality, spiritual imperatives comes; upbringing and education are replaced by forming applied skills and abilities; art doesn't elevate man but entertains him cultivating the lowest needs to an even greater degree than the highest ones. Openness of information and the dependence of its contents from each subject multiply risks for modern culture and engender new types of unfreedom such as manipulation of public opinion, misinformation of large social groups, dark public relations, interference with citizens privacy, etc.

The study of two types of destructive Internet communities shows a whole range of problems behind them, the main ones are: 1) Internal factors are a high level of psychological instability in young people; lack of positive purposes and values in real life; tendency to self-destruction and aggression caused by the legitimizing violence in culture. 2) External factors are social tension in educational institutions, families, in the streets, a high level of violence among adolescents and young people; interest in violence imposed by the mass media and media culture (for example, by movies and games) with violence viewed as a way to solve any problem; intentional use of manipulative psychological techniques as to destroy individuality or as to involve young people in criminal activities;

All these factors have the greatest impact on those who are at risk (having unstable mental state, weak will, high sensitivity, being asocial, craving for extreme sensations, having high susceptibility, etc.). Serious risks are also associated with the transfer of values into the virtual worlds and social networks, which hinders true-life communication and ability to solve problems in real life, and thus sets up a destructive way of thinking and making a person engage in self-destructive behavior.

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Intangible assets and their specific character

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Introduction

As investments in intangible assets bring more added value as investments in tangible ones, this fact has turned knowledge economy from knowledge based economy to economy based on intangibles. As characteristics of economy changes a lot, it is important to economic subjects to follow up: what does it mean that intangibles are economic category, what is important in their context, what are intangible assets economic charasteristics, is there a multiple role of intangible asset in business, what are there impacts on economic and social relations, what impact is on economic resuts. Intangibles performance is important not only within corporations, but also within SMEs and in public sector organisations. These are three specific context to be taken into account when analysing questions. Based on researches and analyzing questions, for economic subjects it is important to come to results, to be competitive. "It is essential for Europe to support the competitive development« is put down in numerous documents: the competitive development of strategic value chains of the future[18], The Digital Single Market[19], the Energy Union[20], Industrial Strategies[21] etc. Many researches and analyzing stand behind them. Based on numerous research done and feasibility studies, investments are decided, also governmental and managerial, whether to treat these investments as a real investment (and their link to property, also to report the property as intangibles can be) or just a transfer (subvention, cost). Through Investment Plan[22] 30% of the funds allocated were devoted to Small Medium Enterprises, 22% to research and innovation projects and 11% to projects that aim at enhancing Europe's digital capacity[8]. The Horizon 2020 programme for research and innovation is 80 billion for 2014-2020, for 2021-2027 it will be doubled. The European Structural and Investment Funds are investing over EUR 44 billion in research and innovation. All these documents, based on policy measures they have a proven track record also for different aspects and links with intangibles: as costs[23], investment, potentials, used and unused, property. Awareness rised and knowledge about intangibles is nowadays far best within corporations, they even invest more than 60% in intangibles rather than in tangible assets, and half of them are investments in branding.

The fact is that management (top and middle, or an entrepreneur) is be accountanble for effective use of resources to come to result as never before. In 4.0 industry, human knowledge, competences and

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skills are performing added value: intangible assets are result (formal or informal), intangible assets are as resources again and again used in business cycle. Still, many people even management still speak about human or intellectual capital and does not analyze performing economic added value that human and social capital bring to competitiveness and growth. Human capital is not a firm property (it is contracted), while intangible assets – they are a firm property and influence economic and social relations. Soete, L. (2017) turned attention to openness as driver for a XXI. century mission-oriented research policy[24]. Awareness to raise and to improve understanding, OEDC has been doing an impressive work[25].

This paper summarises intangible assets specific characteristic, their context impact and differences between intangible based era and knowledge based era. Also European Commission High Level Group Report »Investing in the European Future we want« turns attention to intangibles in its eleven recommendations[26]. This document supports to invest in research and innovation and to develop R&I eco-system to come to added value. "LAB-FAB-APP Investing in the European future we want" recommendations that have started to pave the way for the next EU Research & Innovation Framework Programme (FP 9). Research and innovation and R&I eco-systems demand is A New Agenda for Measurement and Policy[27]. Persistent heterogeneity of R&D intensities within sectors, their evidence and policy implications are stand by Joint Research Centre (JRC Working Papers on Corporate R&D and Innovation, No 04/2017); their research done and other are to have impact of a renewed EU Industrial Policy.

Recommendations are important also in the context of intangible assets creation as they serve as guidelines (recommendations 1,2,4,6,9,10); system and impact-focused approach are needed (2,4,5), also to commercialize innovation (2). Also management is to be system and result based management, to turn attention to performance (performance management).

This paper is to turn attention to key stakeholders as governance, public administration, Academia, long life learning institutions and SMEs to understand how millenium changes affect potentials when producing added value. It is to promote debate among, researches, science, scholars and practitioners how to leverage intangibles, formal or not formal to crate economic, stakeholders benefit, added value and equality as a social value. As R&I are key drivers of competitiveness, growth and quality jobs, it is to overcome existing barriers to more investment in intangible assets not only on micro level, but also on macro level, in European Union. If not unlocking intangibles potential, the gap within equality will continue to be deeper[28], on micro and macro level. Structural features calls for a better understanding

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[24] Soete, L. (2017). Openness as driver for a 21st Century mission-oriented research policy. Speech presented at the 6th CONCORD Conference, Seville. http://iri.jrc.ec.europa.eu/concord/2017/index.html

[25] https://www.oecd.org/sti/inno/46349020.pdf

[26] »Prioritise research and innovation in EU and national budgets. Build a true EU innovation policy that creates future markets. Educate for the future and invest in people who will make the change. Design the EU R&I programme for greater impact. Adopt a mission-oriented, impact-focused approach to address global challenges.

Rationalise the EU funding landscape and achieve synergy with structural funds. Simplify further. Mobilise and involve citizens. Better align EU and national R&I investment. Make international R&I cooperation a trade-mark of EU research and innovation. Capture and better communicate impact« (LAB-FAB-APP 2017, p. 9-22).

[27] Ecosystems: A New Agenda for Measurement and Policy. Speech presented at the 6th CONCORD Conference, Seville.

[28] Coad, A. (2017). Persistent heterogeneity of R&D intensities within sectors: Evidence and policy implications. JRC Working Papers on Corporate R&D and Innovation, No 04/2017, Joint Research Centre

of industrial dynamics[29]. It is worth to invest in intangibles as they even have spill over effects and long term impact. But when investing in R&I, economic subjects are to have under control market and investment decisions, funding, etc. Economic subjects are to be aware of barriers and drivers and to prepare strategy and marketing concept to maximize results of investment.

Methodology

The methodology of this paper is based on mapping of different documents and researches done about investments in science, research and innovation, on micro and macro level. Paper reminds on European Framework Model and presents it use in the context of new age of economy based on intangibles with two positions of intangibles – as a resource and as a result. As first, evidence and characteristics about intangibles are briefly presented. As second, economic characteristics of knowledge economy are presented – what are the differences between knowledge based economy and its investments in research and development (R&D) and intangibles based economy and its investments in R&I. As third, EFQM economic specifities are presented. The summary syntesizes the narrative purpose of this paper, as further scientific research and analysis will assist management to understand why and how to unlock intangibles potentials.

Most of research and analysis done as evidence background of this paper was my work as a member of High level group[30] (HLG). There was a lot of work done: analysis in the context of Interim evaluation of Horizon 2020, analysis of documents, researches and broad stakholders debate[31]. Still, I did additional empirical analysis and desk research, taking a look into balance sheets and reported data; quantitative and qualitative.

Intangibles as economic cathegory

Intangible assets are economic category: they are formal and not formal. If there are entries in chart of accounts and evidence in balance sheet, intangibles act as a property. To be formal economic categories, intangible assets must be identified, measured and valued following International Accounting Standard, IAS 38. Still, the most important intangible assets – brands – are not allowed to be in balance sheet following IAS 38.

Often it is spoken that intellectual capital are intangibles. Intellectual capital is not an economic category and as such it is not put in balance sheet. Physical capital, human capital and social capital, all together, are often named as intellectual capital. Human capital is skills and technical ability of people. Social capital is skills and technical ability of all people, still in the context how people fit together. Either intellectual capital either intangibles, also narrative reporting is relevant to stakeholders. Narrative reporting as a descriptive section in the annual reports used as non-financial information gives a picture of a firm's business, market position, strategy, performance and future prospects. Many times for SME and their banks a debt-to-equity ratio in balance sheets could do good for them. Nowadays several

[29] Moncada-Paternò-Castello, P 2016) 'EU corporate R&D intensity gap: Structural features calls for a better understanding of industrial dynamics'.

[30] Details of the Group's mandate are in LAB-FAB-APP 2017, p. 23, Annex 1. HLG was invited from European Commission through Carlos Moedas, Commissioner for research, science and innovation to draw up a vision and strategic recommendations for Future Europe we want in the context of R&I.

[31] This is presented through LAB – FAB – APP document annexes.

empirical studies (OECD, EIB, European Commission documents) report that the vast majority of the innovations have been developed outside of the patent system; they are know-how, formal or informal intangible assets. Still, due to intellectual property rights IPR costs and time management, for added value in global competition, it is to speed up with marketing management and innovation business, and credits are useful.

There are different classifications of intangible assets. Most used are:

Three categories as computerized information, innovative property and economic competences by Corrado, Hulten and Sichel from 2005 (Thum-Tysen 2017, p. 6). Computerized information includes software and databases. Innovative property (as deliverable from R&D) are mineral explorations, copyright and creative assets, new product development in financial services and new architectural and engineering designs. Economic competences are brands and brand-building advertisement, market research, training of staff, management consulting, own organizational investment.

Hand and Lev (Thum-Tyssen 2017, p. 6), three major forms of intangibles are: (1) those created primarily through innovation and discovery, (2) those that underlie organization practices (including also investments in customer satisfaction, product quality and brand reputation), and (3) those related to human capital.

Intangibles specific characteristic is that its value is increasing in time, while the value of tangibles is decreasing.

Intangible assets are specific to perform and sell. There must be commercialization and innovation must be brought to a market. It is not production that brings most of added value but business model, strategic marketing selling and its branding.

Intangibles nature, their content and context defines entrepreneurship, marketing, management and public wealth to be performed. That is why corporation, SMEs and public sector access to intangibles is different from their three main aspects: (1) specific characteristics, (2) materiality and risks and (3) complementarities among asset types. Strategy, management, entrepreneurship, marketing: all these activities bring to competitiveness. Market and book value of a company is never the same. Its gap is even increasing. “There is evidence of a positive correlation between the market value of a firm and its investment in intangible assets” (Thum-Tyssen 2017, p. 36).

Intangibles impact economic subject and characteristics of the company that produce them. Intangibles have also virtual effects, due to reputational effects what is of great importance for marketing and business. For firm capabilities and entrepreneurial firms, key word is not only technology innovation, but as first the marketing innovation as it is in fact more important than technology based innovation. Due to specific characteristics of intangible assets, there is a risk that investment remains below the social and economic optimum. »Innovation is a key to business success /.../Today’s firms are looking beyond research and development (R&D) to drive innovation. They invest in a wider range of intangible assets, such as data, software, patents, designs, new organisational processes and firm-specific skills./.../«firms that are not part of a multinational group of companies – often small and young firms – may be placed at a competitive disadvantage in undertaking and exploiting R&D« (OECD 2013, p.2).

Intangibles based economy (IBE) and knowledge based economy (KBE)

Industry 4.0 aims to value added. When investing in R&I, intangibles produce more added value as while investing in tangible assets. In intangibles based economy it is investing in R&I, while in knowledge based economy (KBE) it is investing in research and development (R&D). The market for patents and licensing agreements differs from market for computerized information and economic competences (that is why

in IBE half of value of investments is in branding). Important value in R&D is also to get citations and intellectual property rights as results.

When investing in R&D, there is a knowledge production, expectations from R&I are broader: economic and social wellbeing. R&D output is typically codified. R&I are ideas or creation or innovation, know how, embodded in people. As R&I is tacit knowledge, R&I potential can be of use by different agents.

As IBE is different from KBE, economy is different; when investing in R&I, economic differences affect economic subjects. Economic subjects must be aware of them and implement not only science and technology competences, but also governance, managerial, marketing and entrepreneurial know how and know what. The supporting context of institutions, policies, infrastructure, logistics, technology, culture, communications, marketing, knowledge production, business environment, entrepreneurship, intellectual property protection and information and communication technology connectivity, all provide intangibles as property to perform.

In industry 4.0, innovation is the creation, selling, marketing and using of new ideas and products. Within new definition of innovation - innovation is more than technology. EU innovation policy must be based on a definition that acknowledges and values all forms of new knowledge – technological, but also business model, financing, governance, regulatory and social – which help generating value for the economy and society and drive systemic transformation. »Innovation is more than technology. EU innovation policy must be based on a definition of innovation that acknowledges and values all forms of new knowledge – technological, but also business model, financing, governance, regulatory and social – which help generate value for economy and society and drive systemic transformation« (LAB-FAB-APP 2017, p.12). Business, economics, innovation and marketing pushed investments needed for R&I: this is a new era of economy based on intangibles. While KBE was connected with leadership, R&I need a system, governance, management, marketing and entrepreneurship.

Demand and supply of know-how affect innovation and growth. Policy and managers are more and more aware they need to secure the know how. Monitoring & Analysis of top 2,000-2,500 corporate R&D investors worldwide since 2005 showed, that R&D is not enough. Thum-Thysen, 2017, p. 23-35 exposed »Unlocking intangibles brings knowledge«. In innovation era, know how is needed. New ideas, new products/services (sales revenues) are needed for business and social progress together with high class management (also in public sector). Mazzucato (2015) in 'The entrepreneurial state' is exposing state mission and investments without rewards. Key issues we are facing in Economy based on intangibles (EBI), are: innovation drives growth, rising inequality in business, in society and world, the role of management, financial and policy reform.

Westlake and Haskel in their book 'Capitalism without Capital: the rise of the intangible economy' illustrated the value of the firm in knowledge based economy (KBE) era and in economy based on intangibles (IBE) as equations, as follows:

The value of the firm (in KBE) = Physical capital + a residual (knowhow, processes etc.)

The value of a firm (in IBE) = Physical capital + human capital + social capital + intangibles

Knowledge economy concept is building and transforming human resources into skilled workforce equipped with innovative and creative abilities. The economy based on intangibles can create capital: i.e. intangible capital. This intangible capital is replacing physical capital - tangibles. Intangibles became in IBE extra or multiplied value property. That is why it is worth to invest in intangibles as they even spill over effects and long term impact. But when investing in R&I, economic subjects are to have under control system and efficient management, market and investment decisions, funding, etc. Economic subjects are to be aware of barriers and drivers and when prepare strategy and marketing concept to maximize results of investment.

In 1999, OECD, the Organisation for Economic Co-operation and Development, convened an international symposium in Amsterdam to deliberate on the experience, issues and prospects on measuring and reporting intellectual capital. At the same time a number of European Institutions were collaborating to produce a common framework for the identification, measurement and control of intangibles as well as to suggest criteria for the disclosure of information on the intangible determinants of the firm's value. This activity, known as the Meritum Project, produced a report within Framework Programme financed by DG Research in april 2001. Academia will mostly remember the period of knowledge based economy through Bologna reform, and European Qualifications Framework for Lifelong Learning devoted for »The development and recognition of citizens' Knowledge, Skills and Competence[32]« (Then ERA, European Research Area, three years after Lisbon Agenda in 2000 EU to become knowledge based economy, became crucial for the development. The link between knowledge and labour market supply and demand seemed more transparent. To fight efficiently against raising unequality on micro and micro level, it is to make a transparent path of intangible performance: from investment in people's knowledge to intangible assets. As intangibles capitalisation is bringing added value for growth, employment and sustainable development, relationship between intangible capital investment and labour productivity growth is to be under control. »Roth and Thum (2013) confirmed a positive and significant relationship between intangible capital investment and labour productivity growth. Sectoral comparisons of the productivity effects of intangibles, Niebel et al. (2013) identified the manufacturing and the finance sector as the sectors in which intangibles are the most productive in Europe. Chen et al. (2016) found that ICT-intensive industries are those benefitting most from intangibles in Europe« (Thum-Thysen 2017, p. 17).

European Framework for Quality Management (EFQM)

European Framework for Quality Management (EFQM) European Commission presented in 1989; it was renewed in 2013. Usually EFQM is known and broadly used as a model of excellency. EFQM is instrument to focus on result. EFQM is also needed for efficient and reliable management with a vision how to realise added value in best way. There are two parts: enablers and results. Intangibles are a resource, result and key performance result. Intangibles are not exposed within the model cathegories. The closest link to intangibles in this model is presented through innovation&learning component who is influencing the system: innovation&learning inable intangibles – i.e. knowledge, competences and skills performance within EFQM to intangible assets and intangible property to be a result. To "focus on results" is also embedded in the new regulatory framework for the Cohesion Policy 2014-2020 and exposed for future EU programme period 2021-2027; also R&I capitalisation is a regulatory requirement. Also, the role of marketing in the innovation processes. has been described as increasing a firm's ability to recognize customer needs, improving the firm's position relative to competitors, and targeting valuable customer segments.

The framework is the structure or system. The framework introduces nine fields of needed action to come to result and added value. The framework specifies key variables in nine fields: it is the consistent framework for variables that might differ in different contexts and circumstances. When using EFQM, the context is different for corporation, SME or state institutions.

The first field includes system management, result based management, innovation and marketing management. EFQM could have double role: as a tool for system and result based management to use

[32] European Commission's document) http://data.consilium.europa.eu/doc/document/ST-5464-2018-ADD-2/EN/pdf.

in private and public sector, and as a model for researches and analysis needed. Model makes trasparent the way from investing in knowledge to capitalising intangibles.

EFQM as a model could be used for intangible based economy as there can be details for an effective capitalisation proces in institutions, companies, universities, research institutes, non-governmental organisations and SMEs; all what is needed for innovative solutions in nowadays digitised and global world, can find its place are in a EFQM model.

Researching knowledge based economy and intangibles, as a models presented MERITUM was already exposed, but also not to forget that Martin-Castilla and Rodriguez-Ruiz presented EFQM value in the context of intellectual capital and exellence models (EFQM model: knowledge governance and competitive advantage, p. 133-156).

However, EFQM is still very actual: it is a system approach and transparent trail what is happening when transforming knowledge, competence and skills in needed activities to perform outputs and results. There also can be a real audit train if competences of human capital and intangibles are identified, measured and valued.

With a help of EFQM, management could have a comprehensive understanding of intangibles as a source of growth at micro and macro-economic level. As management works within internal and macro regulatory framework, - in this context – through business model management can perform its crucial role and also unlock intangible assets potential. Management, its methods and access should be facilitating the emergence of intangibles based economy. Management is to think about know how and know what creation is to be performed. Last but not least, it is not to forget OECD recommendation »Getting the key framework conditions right for investment in KBE is essential and can be a low-cost step for policy makers in fiscal terms. Appropriately crafted framework conditions are important for the creation and retention of high-value jobs in global value chains (GVCs)«/.../ make it easier for firms to develop and commercialise new ideas /.../encouraging firms to experiment with potential growth opportunities« (OECD Multilingual Summaries 2013, p.4). https://www.oecd.org/eco/growth/GfG-2013-summary-Slovenian.pdf.

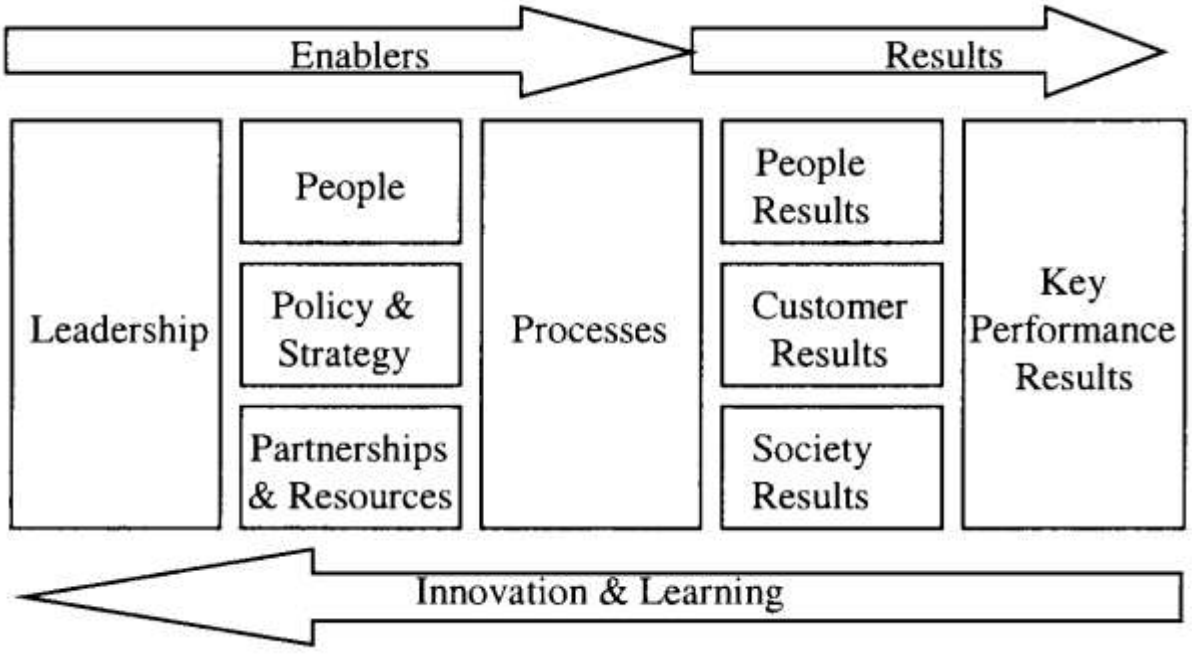

Figure 1. Structure of the EFQM, European Framework Quality Management Excellence model.

Sources: https://www.toolshero.com/wp-content/uploads/2014/01/efqm-model-framework-toolshero.jpg, https://blog.triaster.co.uk/blog/what-is-the-efqm-excellence-model-and-how-useful-for-you, etc.

This framework is still actual and useful as it strengthens analysis and planning action in the following ways:

1. A statement of assumptions/preconditions to come to result (to rethink and evaluate critically).
2. The framework gives researchers a base for further hypotheses and choice of methods.
3. Deriving from resources it addresses questions of why and how in different contexts.
4. It permits simply and systematically describing, also an intangible phenomenon (in the fourth field as a resource and in the nineth field as a result) towards various aspects of research and analysis.

Summary

Research, innovation and knowledge costs do not by themselves produce additional added value. To come to higher added value is multiple and complex task. As first, to innovate, to invest in R&I. Stil, innovation is not only a key stipulation for survival, intangible capital formed out of innovation knowhow and managerial know what, is a key for economics and sustainability. Recommendation would be to disclose intangibles as economic cathegory and report it.

Economic subject is advised to perform results within European Framework Management system (EFQM). This framework is a system, very transparent to use and implement a strategic system approach. In advance business details must be designed. If the system is not settled down (on the state level eco R&I system) investment in R&I is associated with systemic risk. It is also not to forget to Martin-Castilla and Rodriguez-Ruiz, who presented EFQM value in the context of intellectual capital and exellence models and elaborate it more towards intangibles and their reporting instead of putting key results in an intellectual capital perspective.

While in KBE intellectual capital is determining competitiveness, in IBE intangibles assets are key drivers of growth, competitiveness and new jobs. R&D supports process and product innovation. R&I, product innovation and strategic marketing are to perform intangible property of firm. The increasing complexity and speed of innovation development offer opportunities and pose challenges not only to innovation actors at all stages of the technological development, but also to management of all key sectors of managing business and marketing.

While In KBE intellectual capital (human capital, structural and customer capital) are resources, in economy based on intangibles, brands, information technology systems, databases etc. are performed into intangible assets as platforms, business models, etc. and they function as property and resource. That is why managing system is needed and performance to be under control. While investing in R&D there can be leadership, while when investing in R&I there must be top managing of strategy, performance, result based management, marketing management, innovation management, human resource management and management accounting. EFQM is a framework to show how the added avalue/wealth is created in knowledge economy. Still, it is not the same knowledge based economy and intangibles based economy. Also the question, who creates wealth and what are different kinds of labour, are to be most properly defined.

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Measuring the Well-being at work at a Higher Education Institution – A Case Study on ISCTE-IUL

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Introduction

«Sustainable development refers to development that meets the needs of the present without compromising the ability of future generations to meet their own needs» (Brundtland Commission, 1987).

Since its first definition, this has been adapted and evolved and has been firmly interconnected with concepts such as Social Economics, Solidarity Economy, Social Responsibility and Well-being. At the United Nations Conference in 2015, the Agenda 2030 for Sustainable Development emerged with 17 objectives (UN, 2015). These were the result of a more realistic and adjusted view of the current needs of the planet and people, revealing the importance of a sustainable world for future generations.

As the issue of sustainability is a current precept, it is important to realize that to adopt socially responsible and environmentally friendly practices that promote the adoption and fulfilment of these objectives and improve the life and well-being of people, Enabling a healthy and sustainable world for future generations. As part of an international agenda geared towards innovation and sustainability – environmental, economic and social – it is increasingly important to realize the impacts that policy applications in this area have on people.

The organizations, public, private and social sectors, towards at profit or not, have studied and adapted their practices to the current context. It Is increasingly valued and more likely that an organization is considered friendly to people – from its public and collaborators – and from the environment – that has policies to reduce the consumption of paper, water and electricity, among others. The United Nations Global Compact (UN, 2006) program states that social sustainability passes to identify and manage impacts, being positive and negative, in people.

Public educational institutions are one of the examples of organizations that follow the guidelines of the world and European organizations regarding the implementation of sustainability policies. Thus, it is important to understand how these types of organizations apply these policies and how they affect their faculty and staff. Using the case study methodology, we intend to perceive the impact of social sustainability policies, deepening the well-being issue in a public teaching institution.

In this sense, ISCTE-IUL's Sustainability Policies will be explored and compared to OECD's guidelines to understand how the social sustainability agenda and how SDG is being applied in this Organization. To this end, the concepts of well-being and social sustainability will be explored. According to World Impact Rankings of 2019 (THE, 2019), ISCTE-IUL is placed between the places number 201st and 300th (The Worlds University Rankings, 2019).

When searching for how ISCTE-IUL is doing internationally among other universities regarding Sustainable Development Goals, it is the best to position in this ranking concerning Goal 4 - Quality Education (81th).

Goal	*Position*
3 - Good Health and Well-being	301+th
4 - Quality Education	81th
5 - Gender Equality;	101th – 200th
9 - Industry, Innovation and Infrastructure;	101th – 200th
11 - Goal Sustainable Cities and Communities;	101th – 200th
12 - Responsible Consumption and Production	101th – 200th
16 - Peace, Justice and Strong Institutions.	101th – 200th

Table 1: ISCTE-IUL positions at The University Impact Rankings (Source: ISCTE-IUL, 2019)

Regarding the Goal 3 - Good Health and Well-being, that this study will explore further, ISCTE-IUL is placed 301st position, while other Portuguese universities seem to rank higher (The Worlds University Rankings, 2019). This study will try to understand the evolution of the concepts, the measurements applied, their effectiveness and efficiency, to the same extent the way people perceive these changes – the impacts they have on their well-being and their lives and how the measures of Social sustainability existing in the organization where they work influence their well-being.

Methodology

For this study, the methodological option considered was research. It will allow us to understand with detail and comprehensively what is going with the well-being and sustainability policies at ISCTE-IUL and how well-being, social sustainability and social responsibility are defined and being analyzed. We will be analysing articles, books and master and doctoral thesis.

The research method can help to analyze the well-being of ISCTE-IUL's workers and how social sustainability policies are taking effect on them. For that, we will be analysing documents, statistic data and its methodology, and their websites regarding sustainability policies and social responsibility from OECD and European Social Survey.

We will be looking how OECD's countries question their people about how they perceive their well-being and what parameters they use to define and analyze it. On a similar note, we will be analysing how ESS questions Europeans about how they perceive their well-being and what framework they use to guide their research.

On a same note, we will research ISCTE-IUL's documents, statistical data and website to obtain a more detailed picture on how they are defining and applying sustainable and responsible policies.

Measuring Well-Being According to OECD and ESS

There is a scientific interest in studying social, environmental and economic problems. However, since the 20th century, the measures and projects presented have fallen short to the objectives that were proposed, namely:

- To contribute to the development of the concept of well-being, helping to intertwine them with the human perspective;
- To help relate the concepts of Social Economics, Solidarity Economy, Well-being, Social Responsibility, and Social Sustainability and help in the development of metrics to assess welfare that can be replicated in the scientific environment and Social.

The European Social Survey (ESS) and the Organisation for Economic Co-operation and Development (OECD) have focused their research on the study of this topic. Through the questionnaires applied, the ESS obtained a significant notion of what is really well-being: what is it, how people define it and how to measure it. The OECD has developed a metric that allows to averse several parameters of what people consider important for their well-being and their happiness.

However, regarding the evolution of the concepts, this has been stable, since its relevance is increasingly presently, however, its definitions have not changed in a significant manner. There is a long tradition in which economic theory seeks to connect well-being with the total value of income or consumption. Nevertheless, most theories relate to the limitation in determining the change in well-being than its magnitude, not to mention the very level of well-being (Fleurbaey, 2008).

On the political spectre, by studying the well-being it will allow allows policymakers to identify several parameters, such as: identify how the various segments of the population are; perceiving the functioning of subjective well-being; make comparisons with other countries; perceive the future of well-being; identifying how different segments of the population are doing.

Subjective well-being can be a valuable tool for examining how different population groups are doing in society. If some groups have lower wellbeing than others, policymakers can start to ask why. Because subjective wellbeing is sensitive to a wide range of drivers, it reveals inequalities beyond those identified by purely economic measures such as income. To evaluate the impacts of social sustainability policies on the faculty staff of ISCTE-IUL, it was important to learn how the most important organizations are doing it and how they define well-being and its components. The measurement well-being can help us understand what drives well-being and how important are its drivers.

The macro-economic and societal factors that determine wellbeing are often best understood by taking an international perspective and making comparisons across countries. Cross-national data such as that provided by the ESS allow these macro-level factors and the policies that influence them, to be explored.

The OECD Framework:

In 2011, the OECD launches the Better Life Initiative (BLI). They present us with two big groups: the current well-being and the resources for future well-being. As presented on the following image, to understand the current state of well-being, OECD categorized the health status, work-life social connections, civic engagement and governance, environmental quality, personal security and subjective well-being as determinants of life quality. Material conditions, that include income and wealth, jobs and earning and housing, are another part to define the current state of well-being (OECD, 2011).

On OECD's Measuring Well-being Report, it is important to understand how life is being measured ins every country of its organization, Portugal included. Visiting its website — the Better Life Initiative —, we can adjust the data to understand which country performs best in a given category. It is possible to visualize how balanced the OECD countries are in different areas (OECD, 2017).

Fig. 1: Measuring Well-being: OECD Framework for measuring well-being and progress (OECD, 2017)

Countries from northern Europe and North America are more equilibrated in the main areas — the quality of life and material conditions. However, this index shows us that healthy economic performance does not mean that people have the same level of life quality. Countries such as Australia, Canada, Norway and the United States of America have been ranked mainly number one according to their people's income and wealth, jobs and earnings and housing.

However, adding the quality of life features, their ranking lowers and, in some cases, are very unbalanced when compared with the steadiness in material conditions. The United States of America is one of the most equilibrated countries in the material conditions aspects, according to BLI, it is top-ranked. However, it falls short on the aspects of work-life balance (working hours and time off), health (life expectancy), education (adult skills) and personal safety (homicides). This eludes the fact that top economic performance does not mean a top well-being performance. On the other hand, there are countries with fewer resources that have even more difficulties managing the quality of life of its people (OECD, 2017).

Is life getting better for people? Report (OECD, 2017), we can learn that life quality and well-being has improved in the past 10 years, however, it has not grown as fast and consistently has the economy. Despite the shy growth, long-term unemployment is still high and civic participation and life satisfaction has decreased and so did the number of people with family and friends network support. As for the environment, this area bloomed the most with the reducing of CO^2 emissions and the investment on infrastructures (OECD, 2017).

About the well-being perception, looking back at figure 1, we can understand that there are many topics in which people can define their well-being. And other factors such as age, education, and gender can change the way people perceive it. There are societies that are more stable and balanced and others that have huge discrepancies due to factors like corruption and inequality. We can also learn that if people have a stable life and access to the healthcare they consider satisfied with life (OECD, 2017).

For OECD, to further understand how well-being has been measured, they have published reviews of their own social surveys to understand how they can improve and adapt to people's lives. According to

them, measuring well-being should be more than the mental state only, it should focus on how people feel about their lives (Fleischer, Smith and Viac, 2016). To understand how people, perceive their well-being, life-satisfaction and feelings, Fleischer, Smith and Viac (2016) tells us that this evaluation was categorized three different components of subjective well-being:

Life Evaluations	Affect Measures	Eudaimonic Measures
Focus on a person's overall assessment of their life, such as their life satisfaction.	Information on moods, feelings and emotions, including experiences of both positive (enjoyment, well-rested) and negative (sadness, worry) states.	A person's sense of meaning, purpose and worthwhileness in life.

Table 2: *Components of subjective well-being* (Adapted from Fleischer, Smith and Viac, 2016).

The OECD's *How's Life?* report was built based on surveys about how people feel about their life and how they measure it, with a 0 (not at all satisfied) — 10 (completely satisfied) range. Another indicator is the questions about how people define their emotions as more negative or positive according to how they described their previous day and if they have experienced a certain type of emotions in a certain life-event. To complete their research, OECD consults with other national statistics offices (Fleischer, Smith and Viac, 2016).

After analyzing the General Social Surveys within the national statistical systems of most countries, they can compare how every OECD country does it and find the main indicators a process. For OECD, the main indicator of subjective well-being is life satisfaction and most of the countries use a 0 – 10 scale (Fleischer, Smith and Viac, 2016).

Regarding the questions, table 3 indicates the selected indicators on subjective well-being and comparability across the OECD.

Country	Question Method
AUSTRALIA	*The following question asks how satisfied you feel, on a scale from 0 to 10. Zero means you feel not at all satisfied and 10 means completely satisfied: Overall, how satisfied are you with life these days?*
CANADA	*Using a scale of 1 to 10 where 1 means very dissatisfied" and 10 means very satisfied: how do you feel about your life as a whole right now?*
COLOMBIA	*How satisfied or dissatisfied are you with the following aspects: life in general? Very satisfied / satisfied / not so satisfied / not satisfied at all*
ISRAEL	*Overall, how satisfied are you with your life? Very satisfied / satisfied / not so satisfied / not satisfied at all*
KOREA	*Overall, how satisfied are you with your life in general these days? Very satisfied/ moderately satisfied/ neither satisfied nor dissatisfied / moderately dissatisfied / very dissatisfied*
NEW SEALAND	*I am going to ask you a very general question about your life these days. This includes all areas of your life. (Looking at Showcard), where zero is completely dissatisfied, and ten is completely satisfied, how do you feel about your life as a whole?*
EU	*From 0 (not at all) to 10 (completely), how satisfied are you with life as a whole?*

Table 3: *Social surveys having similar indicators to the OECD* (Adapted from Fleischer, Smith and Viac, 2016)

It is possible to understand that most countries adopt a similar question methodology, using a scale from 0 to 10 or options from *Very satisfied* to *not satisfied at all*. It is a simple way of being able to process qualitative information.

The European Social Survey Method:

On a similar note, focusing on the European context, the European Social Survey (ESS) gives us a more detailed picture of their work and how they do it. Visiting their website, we learn that they have

been collecting national data on wellbeing every two years since 2002 including summary measures of subjective well-being. To have a deeper understanding on how people perceive their well-being, they have divided their work into several rounds with 'rotating modules' that change every round, focusing on different dimensions of well-being (ESS, 2019).

In figure 2, showed bellow, by dividing every important aspect that defines well-being in different rounds, it is possible to understand with depth how every European country measure their well-being. Claiming that the promotion of well-being is being an important issue to some European policymakers, they extend the analysis beyond that. The module Personal and social well-being was first introduced in 2006/2007 and repeated in 2012/2013, maintaining their focus on both personal and social well-being as well to validate a new scale of positive well-being and questions regarding well-being-promotions (ESS, 2019).

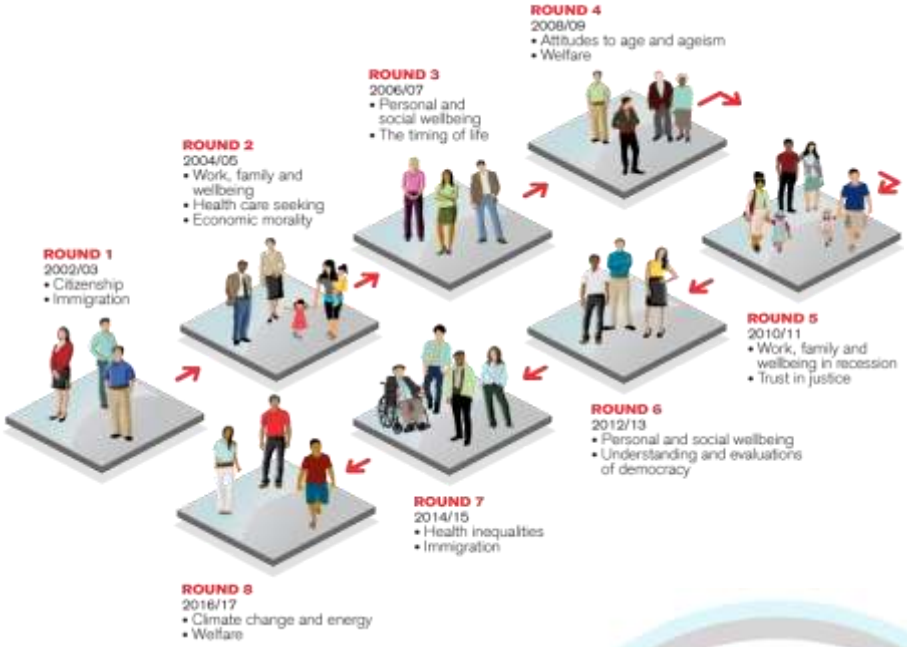

Fig. 2: *Rotating Modules Fielded in the ESS Rounds 1 - 8* (source: ESS, 2002-2017)

The ESS approach includes measuring life satisfaction — the same as OECD — and happiness, both focusing on a positive approach, a more human one and less statistical. They include the concept of flourishing and its dimensions, such as autonomy and self-determination, interest and engagement, positive relationships, sense of meaning and purpose in life. With these indicators, ESS was able to learn with more precision how people feel about their life and to link these findings with personal well-being to social well-being and the importance of interpersonal and societal-level experiences and behaviors. On the same note, they also approach three main dimensions to measure well-being: family, work and well-being. On this module, ESS was able to determine how people manage their life at home, with their families, and at work and how they conciliate these three dimensions in their lives. Despite on focusing more on the positive side of well-being and its dimensions, they don't put aside the importance to understand how people are dealing with symptoms of depression, and they can be both used to measure depression or to link single items to other related concepts (ESS, 2019).

The ESS makes a huge effort to understand the depth of how people define their well-being. Considering hedonic and eudemonic well-being as two different but highly correlational concepts, they can cross-reference national data. With that, they understood that the "most countries with high hedonic well-being also report high levels of eudemonic well-being", but there is more variation in the first one than within the second one. This can be related to socio-demographic characteristics such as gender (ESS, 2019).

It is possible to understand the main differences between hedonic and eudemonic well-being and how they have found a way to question people about it. Hedonic well-being indicates how happy and satisfied feel and eudemonic well-being indicates how people perceive their skills and how secure they are about them and how they feel about life.

Evaluative wellbeing	Covers individuals' overall estimations of how well their life is going, including feeling satisfied with life and feeling happy overall.
Emotional wellbeing	Includes positive day-to-day feelings such as happiness and enjoyment of life, and lack of negative feelings such as anxiety and depression.
Functioning	Includes feelings of autonomy, competence, engagement, meaning and purpose, self-esteem, optimism and resilience.
Vitality	Includes sleeping well, feeling energised and feeling able to face the challenges that life presents.
Community wellbeing	Covers an individual's feelings about the community in which they live, including trust in other people, feeling supported by members of the community, and experiencing a sense of neighbourliness.
Supportive relationships	Relates to individuals feeling that there are people in their lives who offer support, companionship, appreciation, and with whom they can discuss intimate matters.

Table 4: *ESS Six Well-being Dimensions* (Adapted from ESS 2019)

"After analyzing their data, the ESS correlates the results of the six dimensions of each European country giving us a visual map in which dimension each country performs the best and worst and how balanced it is. And that there are significant differences by age group and income. Their data demonstrate that people's well-being age group changes according to the well-being dimensions – for instance, according to ESS, "whilst vitality and emotional well-being decline steadily with age, functioning scores remain fairly consistent across age groups, before declining in the oldest age group" (ESS, 2019).

On the other hand, ESS findings suggest that there is a strong positive correlation between the different well-being dimensions and total house income. Nevertheless, the correlation between income and community well-being is not significant, suggesting that people with higher households' incomes tend to score higher across the well-being dimensions (ESS, 2019). ESS asks *What is a decent society?* (ESS Round 6, 2012/2013). Figure 3 shows where people can communicate how they perceive a decent society.

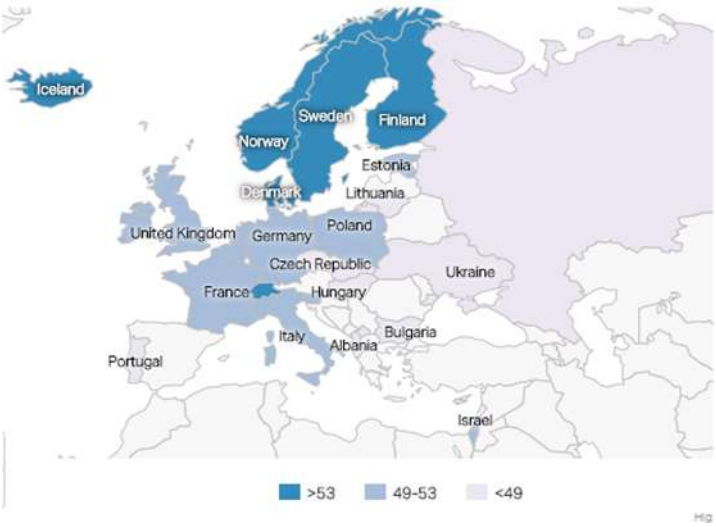

Fig. 3: *Overall Subjective Index Scores across Europe* (source: ESS Round 6, 2012-2013)

As shown in Figure 3, we can easily identify which countries have the most positive views about their society and which countries have the least positive views. To understand this, ESS (2019) has defined four quadrants with their own domains:

Fig. 4: *European Social Survey Framework on Economic Security, Social Cohesion, Social Inclusion and Empowerment* (Adapted from ESS, 2019)

It is easily perceived that the ESS has developed and adapted its surveys and methodology with the times. They have improved their surveys with a more qualitative approach and to be able to translate that into graphs and tables to take a picture of how Europeans perceive their well-being. With their tools, we can learn that material conditions play a huge role in how people perceive their lives and how it does affect them. And the importance to ask people how they feel gives us more complete knowledge of how life is for Europeans rather than only looking to GDP numbers that can be misleading.

How is ISCTE-IUL Measuring its Well-Being?

Social Responsibilities policies in Public Superior Institutions (PSI) are an important pillar for them to be able to measure their people well-being. These types of institutions have n important role in society,

however, they differ from any other type of organization. They have a very specific mission and strategy in society and its mission is part of a historic legacy and the institution memory (Silva, 2011).

According to EU (2001), Organizational Social Responsibility (OSR) of an organization is an expression of how it can integrate social, economic and environmental concerns on its practices and with their interactions with stakeholders in a voluntary way. Therefore, OSR is established on an organization's voluntary basis, going beyond their legal obligations; there is an interaction, a relationship based on sharing and partnership between stakeholders; and social and environmental concerns are integrated in first hand in their practices/activities. PSI are an important type of organizations in society and in this context, OSR demands the respect of three domains: culture (firm values, clear criteria and solid principles), a leadership (commitment) and an organizational environment that promotes socially responsible behaviors. They also have an important role in the development of societies (Silva, 2011).

However, they tend to become very autocratic and technocratic and they can have different types of management and intern leaderships. The academic side brings freedom to these types of organizations, but sometimes they promote the most individualist side. We can verify that there is a model based on representativity without responsibility, having a heavy hierarchy system. Therefore, to understand how PSI can be a social responsibility organization that promotes well-being through its sustainable policies, we must understand how they function – their purpose and the legal mechanisms that they obey. Furthermore, PSI have the main role in society to promote quality education, emanating a intellectual vitality and, for that, being a core for social change and development (Silva, 2011).

As a Public Superior Institution, ISCTE-IUL has come a long way to promote well-being, through social sustainability policies. According to their website, ISCTE-IUL's (2018) principles to a more sustainable organization are to:

- ***Involve,*** *in an* ***inclusive*** *and* ***participative*** *way, the ISCTE-IUL community and other stakeholders in the definition, implementation and evaluation of actions for the improvement of its environmental and social performance;*
- ***Create, transmit*** *and* ***share scientific knowledge*** *related to the Environment and Sustainability among several scientific areas. This will allow highly qualified professionals to better understand their responsibilities and create opportunities for improvement thereby providing a positive impact on the environment, society and the economy;*
- ***Take into account*** *environmental protection practices during the strategic planning and annual activity plans, including pollution prevention measures within all activities, from a local and to a global level;*
- ***Improve*** *environmental impact by adjusting the management systems, processes and campus operations to reduce consumption (e.g., office supplies, energy and water) and the generation of waste and emissions, while enhancing the living environment on campus;*
- ***Comply with all legal requirements*** *and other regulations endorsed in the areas of environment, sustainability and social responsibility;*
- ***Assess and continuously improve*** *environmental and sustainable performance by implementing measurable performance indicators and conducting regular audits;*
- *Continuously* ***improve*** *the Environmental Management System (EMS) for the improvement of its environmental performance.*

At first glance, we can perceive their commitment towards people — students, Professors, and staff — , the environment — with very active policies about reducing unnecessary consumption — and to maintain a top-quality investigation program to keep up with the social, economic, political, environmental and cultural changes by promoting their intellectual capital.

As for dimensions, ISCTE-IUL defined three main dimensions:

ECONOMIC	- To contribute to the economic growth of the country by buying national and positively impacting the surrounding communities; - Improve the efficiency in the use of resources; - Improve students support; - Contribute to the creation of jobs and decent work; - Promote teaching, research and university extensions.
ENVIRONMENTAL	- ISCTE-IUL Environmental Management System (EMS); - Defined 14 environmental aspects of its activity that impact the environment and defined how they can improve its impact.
SOCIAL	- ISCTE-IUL Strategic Plan for 2014/2017 aiming to identify practices of Social Responsibility regarding the ISO26000 requirements; - Working Group on University Social Responsibility since 2012 to change knowledge with other foreign groups to identify and share good practices; - Observatory of Social Responsibility and Institutions of Higher Education launched by the student forum with the state Department of Higher Education; - Clear Strategic Social Responsibility Objectives.

Table 5: *ISCTE-IUL's Sustainability Dimensions* (Adapted from ISCTE-IUL, 2019)

Focusing on the Social Responsibility dimension, we learned that ISCTE-IUL defined a clear but general objective Social Sustainability, ISCTE-IUL (2018), for this area, including to:

- Promote a socially responsible organizational behavior, based on ethical and democratic practices;
- Guide the institution to act in an ethical, transparent way, respecting the interests of the academic community;
- Improve the well-being, quality of life, health and safety of all members of the academic community;
- Promote active and responsible citizenship, taking on projects involving local communities and societal challenges;
- Increase services to the community, involving internal and external stakeholders;
- Promote academic success and combat abandonment in higher education;
- Promote lifelong learning and inclusive education;
- Provide a reconciliation of the professional, family and personal life of the members of the academic community;
- Promote the feeling of belonging to the institution;
- Increase the level of satisfaction of all employees.

They aim to improve the general knowledge of a socially responsible organization, relying on ethical and democratic practices, to improve well-being and quality of life for all the academic community and to increase the level of satisfaction of all the employees, and to improve their services and their relationship with their stakeholders.

ISCTE-IUL follows general guidelines of how OECD and ESS define and measure well-being and quality of life keeping also in mind the Sustainable Development Goals of the 2030 Agenda for Sustainable Development promoting teaching and researching good practices.

Considering the Goal 3: Good Health and Well-Being, Goal 10: Reduce Inequalities and Goal 15: Life on Land, ISCTE-IUL became one of the partners of the Project INHERIT — INter-sectoral Health Environment

Research (2016) to help to promote the health of communities and a sustainable environmental world. On the same page, ISCTE-IUL has promoted conferences regarding sustainably, mobility, energetic revolution, and digitalization and has been represented in the most important conferences regarding the Goal 3 and Goal 8: Decent Work and Economic Growth.

We can easily understand that ISCTE-IUL has a firm external policy regarding well-being and social sustainability in a way that they promote conferences and events and want to have a huge role on the research of these domains, however, it falls short on how they really measure their staff well-being. They do not have, apparently, a system or metric to understand how people feel about their lives and how these policies are really affecting them.

As for Human Resources – faculty staff, according to their website, they demonstrate to have the following numbers:

HUMAN RESOURCES	NUMBERS
Total full-time Faculty (December 2017)	301
Full-time faculty holding a PhD	99,7%
Total researchers assigned to 100% R & D (December 2017)	360
Total non-teaching staff (December 2017)	263
Total full-time Faculty (December 2017)	301

Table 6: *Human Resources at ISCTE-IUL in 2017* (adapted from ISCTE-IUL, 2017)

Regarding those numbers, ISCTE-IUL have a big mass of human resources that are affected both positively and negatively by their policies because there are no clear data expressing those concerns. By applying in their organization, the SDG and its directives, they also should look at the work that OECD and ESS do to understand how life if for their people. And by consulting their Handbook of Quality (ESS, 2018), is notable that they do not explore the OECD and ESS resources on measuring well-being, quality of life and happiness of their staff.

HUMAN RESOURCES	Professors in Effective Functions (n)	Professors Teaching outside ISCTE-IUL (n)	Total
Career Professors	301	15	316
Invited Professors:	203	4	207
a) Full-time	11	1	12
b) Part-time	192	3	195
Total Faculty (career + faculty)	**504**	**17.3**	**523**

Table 7: *Faculty Staff at ISCTE-IUL in 2017* (adapted from ISCTE-IUL Human Resources Unit, 2017)

Table 7 presents us with a closer picture of how faculty staff is constructed. From 504 faculty staff, less that half are invited Professors, and the majority are working part-time. The ISCTE-IUL's *Sustainable Highlight Report* (2017), and *Activity Report* (2017) where the main goals for a more sustainable organization are defined and evaluated, according to de United Nations Sustainable Development Goals.

According to ISCTE-IUL (2017), they aim to *promote the integration of sustainability contents in Curricular Units in the three study cycles* and *to increase research activity directed towards the achievement of the SDG* between 2018 and 2021.

Alongside those main goals, ISCTE-IUL (2017) developed a strategy, as presented in table 8, regarding the SDG, their strategy and their activities to achieve that.

GOALS	SCOPE	HIGHLIGHTS
1. Create a platform that promotes the debate regarding Social Responsibility at Public Higher Education Institutions; 2. Share Good Practices within institutions.	Policy Development and Research: Executive Council for the elaboration of the Green Book for Social Responsibility and Public Higher Education Institutions	In January 2017, ISCTE-IUL joined the collaborative network of Social Responsibility and Public Higher Education Institutions.
Sustainable Development Goals: 3. Good Health and Well-being; 10. Reduced Inequalities; 15. Life on Land.	Policy Development and Research: INHERIT – Inter-sectoral Health Environment Research for InnovaTions	It is a four-year project that will study European experiences that promote health of communities, being environmentally sustainable at the same time.
Discuss major trends that are re-shaping mobility and highlight future challenges and address new services and solutions for the current challenges.	Conference about Mobility – ISCTE-IUL and Brisa (2017): On October 25th, it was discussed new ways of sustainable mobility, that promoted the debate about digitalization, sharing and energetic revolution.	It allowed to get to know new start-up mobility businesses.
Sustainable Development Goals: 3. Good Health and Well-being; 4. Reduced Inequalities; 10. Life on Land.	International Collaboration, Project CARE – European Early Childhood Education and Care: Develop an evidenced-based and culturally sensitive European framework of developmental goals, quality assessment, curriculum approaches, and policy measures for improving the quality and effectiveness of early childhood education and care.	An interdisciplinary team will: - Build a framework, based on competencies and skills that young children need to develop in current societies; - Identify the conditions that must be fulfilled to promote child development and well-being; - Identify strategies and policies measures that support access to high-quality provisions.
Sustainable Development Goal:	Collaboration with health organizations: 1. Verbal Selective Reminding Test;	1. Validate a brief international assessment for multiple sclerosis for

4. Good Health and Well-being.	2. Recording, Investigation and analysis of Accidents (RIAAT).	the Portuguese Population; 2. Researchers develop a free of charge tool (RIAAT) to help companies register and analyze their accident data.

Table 8*: ISCTE-IUL Sustainability Policies Highlights in 2017* (adapted from ISCTE-IUL, 2017)

Table 8 highlights what ISCTE-IUL has done regarding the United Nation's Goal 4: Good Health and Well-being. They have promoted a very strong external policy, hosting several conferences and events do discuss sustainable development and well-being policies, they became part and created projects, with other organizations, to study, to create knowledge, and develop tools to promote a more social, economic and environmentally sustainable world.

As for Internal policies, ISCTE-IUL (2017) rely on creating a strong curricular unit and a Sustainability Commission, to promote and make sure that the sustainable goals defined in ISCTE-IUL's sustainable strategy are implemented. They also considered important to:

- Appreciate the work of ISCTE-IUL's staff, to promote a qualified career for its staff, a suitable and balanced distribution of the staff service;
- An adequate evaluation of the staff performance regarding the challenges of teaching and research;
- A review of the recruitment process and careers of the non-faculty staff.

To achieve those goals, ISCTE-IUL Activity Plan (2017) included elaborate career plans for ISCTE-IUL's staff, by departments and an opening for all faculty staff, ultimately promoting jobs in this field. They also included applying more transparent and balanced measures, though a more severe use of the law and regulations in force. And, regulations about the job insecurity of faculty and non-faculty staff reviewed and create an opening for those people who are not secured.

Conclusions and Proposed Research Survey

After presenting the main guidelines on what and how social responsibility in PSI, well-being, quality of life and happiness is and are being measured in different instances and different contexts and what this work aims to, we can understand that it is important co-contribute for the growth of concepts such as well-being. Relying on what OECD and ESS have provided us, namely their metrics and surveys, and how ISCTE-IUL does measure the well-being of their staff, it will be expected to develop and adapt these metrics on the staff of ISCTE-IUL and to contribute for the improvement of their well-being.

After consulting ISCTE-IUL data on Human Recourses and how they want to evaluate their sustainable goals and policies, can learn they don't reach out to the depths of what measuring well-being really means. They want to promote more secure jobs and to become an environmentally friendly organization by consulting how many publications were made, how many curricular units have the sustainability theme being studied, how many faculty and non-faculty staff is going to the organization's board. ISCTE-IUL's HR numbers illustrated that there is a relevant number of invited faculty staff that are only part-time workers and that the employment insecurity is an important issue that ISCTE-IUL wants to overcome.

Nevertheless, the social sustainability pillar is being left behind. It is important to consider the well-being dimension, illustrated by OECD and the ESS, to undoubtedly improve peoples – to make them happier, healthier and enhance their performance. Measuring well-being is an important policy to improve social sustainability and social responsibility from the inside of the organization to the community. ISCTE-IUL aims to improve research and teaching, align with the ISO26000 requirements, be part of social responsibility and sustainability debates, groups and strategies and to have clear goals regarding these topics. It does not truly measure the health and well-being presented in Goal 4 on SDG, rather than only focusing on the job security issues.

According to OECD and ESS, well-being includes job security as one of its components. To understand it, is important to perceive how ISCTE-IUL's staff is perceiving its well-being. It is necessary to look at well-being, social sustainability as a diverse dimension that have different areas that need to be considered to have a clear picture on how SDG are being applied in ISCTE-IUL.

Moreover, our expected results are: expanding the knowledge about well-being; getting to know social responsibility practices in ISCTE-IUL and how are they being applied; consider that well-being is an approach of business ethics; and how to measure well-being according to SDG's.

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Digital Transformation of the Enterprise Value Chains

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Introduction

This conceptual paper intends to present the impact that Digital Transformation is also a Value Chain Transformation, because companies are able today to address the DIKW cycle (data transformation into information, knowledge and wisdom) in real-time mode. Those companies that have a structured and innovative Information Systems and Digital Strategies will be able to achieve an efficient model for the referred DIKW cycle, which means these companies will optimize their internal operation function, referred as optimum market value function. So, the goal of this conceptual paper is to present evidences that today, the Information Systems are a core activity for companies, side-byside of Logistics, Operations, Sales & Marketing and Post-services, meaning that they are proactive wheels in the enterprise strategy. Companies that understand these new trends of Digital Strategy, are the ones that will be more prepared to face future market competitions.

From the Information Age to the Information Prediction

In 1985, Michael Porter referred that "the information revolution is sweeping through our economy" (Porter and Millar, 1985). Today, after more than 30 years of this statement, we read it and think "it is obvious", but at that time, like today, the majority of the enterprises' decision makers tend to forget the new challenges. If in the 80's and 90's, companies were starting to face the challenge to create data and get information, today, data and information are already considered commodities, meaning that decision makers need to upgrade their information and digital ecosystems to get knowledge and wisdom, in order to be able to take the lead and be able to get a competitive advantage. This is known by the famous DIKW – data, information, knowledge and wisdom pyramid – supposedly identified by Ackoff (R.L. Ackoff, 1989).

There is a set of discussions about the relevance and the real applicability of the DIKW Hierarchy to enterprise methodologies, like the ones referred by David Weinberger in his HBR article (Weinberger, 2010) saying that "knowledge isn't determined by information, because it is the knowledge that decides which information should be important, or by Jennifer Rowley when in her research of several study analysis concludes that the main pain point to adopt the hierarchy is that there is "less consistency in the description of the processes that transform elements lower in the hierarchy into those above them" (Rowley, 2007). Although these sceptics on the DIKW process, the majority of those researches don't refer that the DIKW hierarchy should be considered has a spiral of knowledge, meaning that the pyramid is in fact a virtuous cycle of growing knowledge (Fig. 1 - DIKW virtuous cycle searching for the optimum market value function), where the predictive models should be applied in the realworld environment and next collect the data from what really happen, which will be transformed into information, that will be analyzed to get new knowledge and generate new predictive wisdom. Basically, and the next figure concept, tries to represent the Knowledge Management spiral to be considered and the mathematical function model that is always searching for the "perfect" function, named as "optimum market value function" (OMV function) with the exact reactions of the real world.

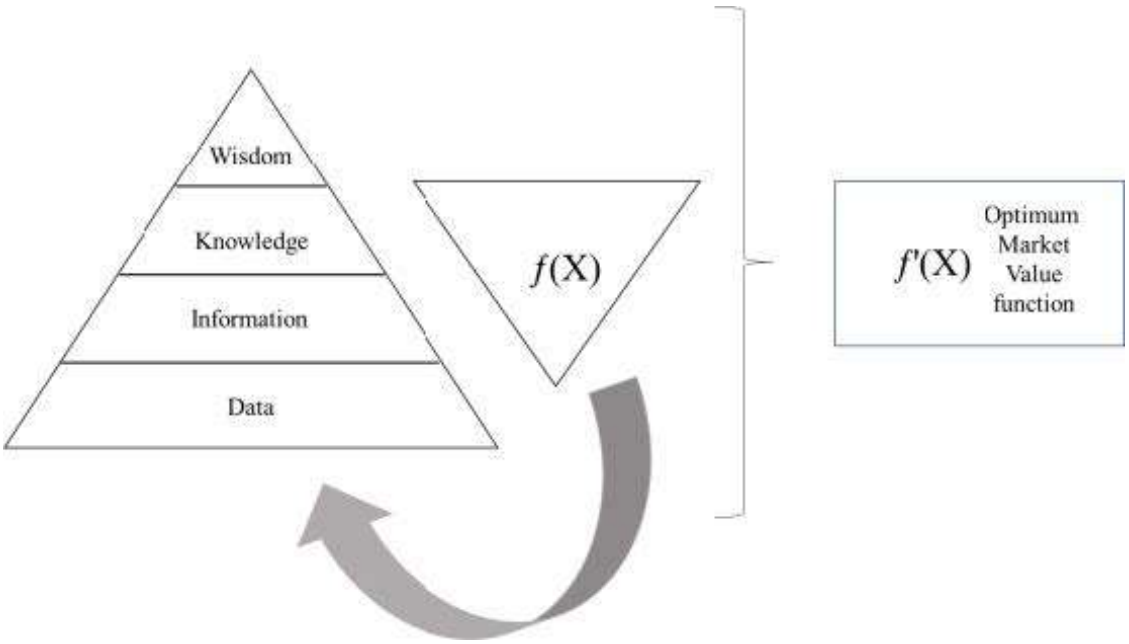


Fig. 1 - DIKW virtuous cycle searching for the optimum market value function

The reality is that the DIKW hierarchy, which is a Knowledge Management process basis, has surpassed the enterprise strategy concepts, being today a reality with the emerge of new technological and business trends based on Big Data (Rothberg and Erickson, 2017), Internet of Things (IoT) and Artificial Intelligence.

There are several cases in the real business world several, even on the primary sector, which is supposedly an analogic industry, but the transformation of this industry is searching to achieve exponential efficiencies with deployments of "connected farms", "soil-moisture sensors", "autonomous tractors" and "stock and animal wearables" (Kite-Powell, 2017). What are these changes? Basically, with IoT, the several sensors are data producers, that bring information to the farm management, which across time the knowledge is created and with technology the predictability will be achieve. This is only valid because there is a business goal, namely for controlling diseases, be more accurate in artificial insemination or milk quality. The real examples of the DIKW virtuous cycle applications are for instance develop by Fujitsu, the Japanese technology firm, and its customers. And this is not recent, because Fujitsu started this business and technological deployment, with a Microsoft cloud infrastructure (O'Reilly, 2015), in a Japanese farm in 2013 (Gallagher, 2015), where the sensors were pedometers attached to cows delivering the steps given by cows (data), which permitted to see the visualize the cows position (information) and understand the normal and the unnormal behavior of the cows, which led to accurate detection of estrus (knowledge). This technology implementation (IoT + Big Data+ Artificial Intelligence together) permitted them to be 70% more productive than before, because they've got +95% of estrus detection accuracy versus 56% previously and a 67% pregnancy rate versus 39%. But this case gives us the fundamental vision to achieve the optimum market value function (OMV function) which was that after a set of cycles of data information- knowledge, they've found the wisdom ambition, which was to get an high level of accuracy that making the insemination prior to the optimum point (16 hours after the first detection of estrus) they probably would get a female, but if they make the insemination after the optimum point of insemination they probably would get a male. This is an enormous capability for the business planning, which is to be able to control their operations and fit the future contracts, imagine a contract to sell meat or milk within 1 year. Basically, that farm will be able

to generate what they want, in their production environment, according to their sales order, it is the applicability of a Just-In-Time fulfilment operations in an industry that was miles away of this concept. This is a dream come true for any business, which is to control almost all the variables in their operations. The challenge is to keep moving on the DIKW virtuous cycle, maintain the enterprise ethics and to be able to control all the value chain.

Examples like this one are starting to happen in other industries, like healthcare, government, logistics, etc. with proven business values, not only on efficiency and also on effectiveness (AIG, 2016). The investments on these set of technologies to create the wisdom level are enormous, from big companies small and medium businesses. The movement to align the DIKW hierarchy with technology to achieve new business innovations to get competitive innovations, from big companies like Coca-cola, GE, Rio Tinto, Bank of America to small companies like Pulmonary Apps (Healthcare), Team Companies (HR Services), Harps Food Stores (Retail) and many others (Adam C. Uzialko, 2016; Svetlana Pyatakova, 2018).

If we analyze B2C market, companies would search and invest on the identification of the set of variables that influence their customers. Basically, and knowing that the main companies' goal is to generate value for its stakeholders, and in particularly to generate money to their stockholders. The challenge would be to have the "perfect" OMV function to control their customers as "puppets".

This is a process of creating the culture for an Enterprise Intelligence, which is the business transformation of understanding of the power that data can deliver, as a value added for the business.

A real known example of the "puppetization" is the basis of well-known public scandal about the data breaches of Facebook and used by Cambridge Analytica (Granville, 2018). The underneath concept of what happened, is in real, nothing new and shouldn't be a surprise, because since the beginning of the creation of the Business Intelligence concepts this was the goal (Liautaud, 2000). The title of the book of Liautaud is clarified: "e-Business Intelligence: turning information into knowledge into profit" and it was written in 2000.

So, and knowing that Business Intelligence is a set of "mathematical models and analysis methodologies that exploit the available data to generate information and knowledge useful (…)"(Vercellis, 2011), a company makes profits selling more, and it only sells to customers, meaning that the mathematical models and analysis methodologies are in fact the first steps to achieve the OMV function, meaning that there was since the early stage of the decision support systems (D. J. Power, 2018) a goal to achieve the control of all the variable of the customer and the internal processes.

The Digital Transformation of Porter's Value Chain

Michael Porter in his book "Competitive Advantage: creating and sustaining superior performance" (Porter, 1998a) has introduced an important concept, that has established a standard in the economics science and which explains the systematic structure of the set of activities needed to deliver products or services value added by enterprises: the Value Chain. At that time, Porter also understood the Information value has a fundamental infrastructure to achieve efficient models, between the several flows that optimize the support and core activities of the enterprise. Although, today the Digital Transformation paradigm and the achievement of technology maturity higher levels, the importance of Information Systems has growth to be a fundamental source of sustainability and acceleration in the value chain, like described by Jim Collins when he refers that the Technology Accelerators are one of the explosions in the flywheel momentum (Collins, 2001), which means that the technology is in between of the processes and the several resources of the companies.

Knowing that Information Systems are different from Information Technology , because it is a set of three main components – People, Processes and Information Technology – (Bourgeois, 2014) and understanding the value of the information within today's business world, also predicted by Michael Porter and other authors, and the confirmation that technology is a fundamental accelerator for efficient and sustainable companies, means that the Information Systems are more than the Technology development within the support activities of the value chain. In this 21st century, Information Systems need to be understood as a primary activity in the daily basis of the company and essential for the product or service delivery (Fig. 2 – Second Generation Value Chain). This recognition as a primary activity is the assurance that there is a specific and critical area within the company that is always searching for the right fit between people, processes and technology. This will assure the today's and near future competitive advantage.

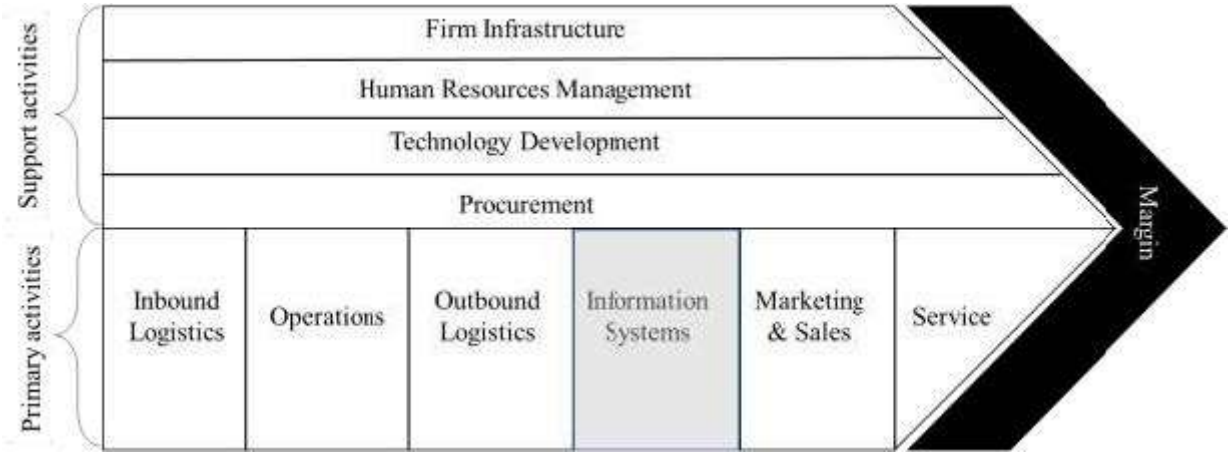


Fig. 2 - Second Generation Value Chain

Several authors analyzed that Information Technology, by their own, suffer from the "productivity paradox" (Erik Brynjolfsson, 1993), which means that they didn't improved business productivity and pointed out a set of mismanagement activities, neither their usage would bring true advantages to higher productivity (Erik Brynjolfsson and Lorin M. Hitt, 1998). Additionally, Nicholas Carr in is article "IT Doesn't Matter" (Nicholas Carr, 2003) touched the pain point, when he understands that Information Technology is a commodity for enterprises, like water and electricity. In 2003, when Carr wrote this article, he knew that the competitive advantage was not on technology, but the way that companies used it and leverage it as a strategical issue. This is an example that the competitive advantage is not on Information Technologies, but on Information Systems.

Companies need to have this Information Systems Management has a focal point in the company, to assure that the DIKW virtuous cycle, previously explained, is a strategical and core activity in the value chain. The appearance of roles like Chief Information Officer (CIO) and Chief Digital Officer (CDO), in the organizational structure of several companies, are examples of that value chain change. They are not the Chief Technology Officer (CTO), which manages only the technology infrastructure (the commodity factor), meaning that they assure that the technology is working in the expected delivery of the operational flows within the company. A CTO isn't expected to be a strategic engine, but an operational engine aligned with the day-to-day support of the enterprise infrastructure, like viewed in Porter's Value Chain (first generation). CIO and CDO are engines for the Enterprise Intelligence, meaning that their roles are more aligned with strategic future and long-term movement of the enterprise.

Information Systems need today to be understood as a strategical influencer of the company, meaning it is not the "old" IT of a company, or in terms of an analogy with the 'well known' ecologic food chain, popularized by Charles Elton in 1927 (Elton, 2001) in his book "Animal Ecology", Information Systems has climbed up from the producers and decomposers to the Top Carnivores, meaning that they were seen just has the technology support and are (should) now a fundamental strategic decision maker in the "Decision Chain". This happens due to the fact we're now in the world that data is transformed in information, where the business transactions are no longer made in traditional ways (supplier + distributer + customer), but are a set of possible networked transactions (Angela Andal-Ancion et al., 2003), in other words the knowledge and the ability to understand that the Information Systems are a strategic competence and a primary activity to achieve a sustainable company with competitive advantages. For that reason, Information Systems are the engine that can join business, technology and information. Information Systems (people, processes and technology) ensure that the long-term strategy and goals are present in the overall decisions.

It is also relevant to confirm that in IBM CIO Study 2009 (IBM Corporation, 2009), it is referred that "CEOs are more dependent on CIO insights to innovate and improve these processes", confirming the climb up on the "food chain" of the enterprise decision make, which in practical terms is the recognition of the importance of the constant and fundamental work made by the Information Systems, to leverage data and analytics and creating efficiency in new or existing processes within the company.

The Importance of a Strategy

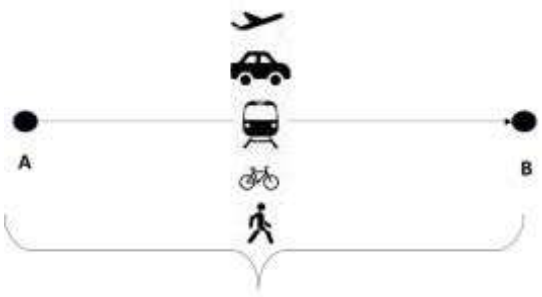
It is a fact that Marketplaces today are living very competitive and saturated times with products, offerings and other services to a global consumer base, meaning that no business can afford to be without detailed information about: their business (financials, accounting, revenues, costs …), their customers (profiles, psychographics, new habits …) or changes that are impacting their business future. That is a primary reason to develop a strategy, to assure that managers can have a decision support guideline and rules to create the path of their business scope and growth, even knowing that they will make decisions under partial ignorance (Ansoff, 1965). Defining a strategy is to make a business approach to define goals and policies which need to be carry out to achieve the competitive positioning in the environment of the company (Porter, 1998b). One way to understand the concepts of the word Strategy is to know the origin of the word. Strategy derives from the Greek word stratēgos, which is formed by two words: stratos (army) and ago (ancient Greek for leading). This meant that stratēgos referred to the military general during the age of Athenian Democracy, which was able to understand the environment and lead the troops in the field. So, it is easy to understand, that a corporate strategy is the set of guidelines with a scope under the internal and external environment of the company, knowing which resource capability the company has, in order to be able to allocate and reallocate them in the field, according with a set of values, expectations and goals to be achieve in the long term (Johnson and Scholes, 1993).

It can then be resumed that Strategy is the pattern of resource allocation decisions made throughout an organization. These decisions encapsulate both desired goals and beliefs about what are acceptable and, most critically, unacceptable means for achieving them. One of the most important decisions, when a company is defining its strategy, is to know exactly what are the paths that doesn't want to go, because de way to achieve its goals there will be several temptations to change, several opportunities to allocate new resources that aren't at the core values, etc.

A strategy starts always with a vision, which determines exactly what is the target to be achieved, or at least, the field of opportunity to be surpassed. This vision milestone definition is the trigger for the strategy process definition, which can be resumed in three main steps: analysis, choice and

implementation (Johnson and Scholes, 1993). The analysis can be described as the process of internal and external understanding of the environment, the culture, the capabilities and beliefs.

The choice is the generation of paths to achieve the vision, meaning that, for example, we have several route options to go from city A to city B (by car, by train, by air, by bicycle, etc.) and each option has an economic cost (Fig. 3- Economic function cost of strategy route options), where it need to be understood which are the variables that need to be considered (for example time to achieve, toll costs, comfort of the travel, among others) and the weight of each variables. This symbolic exercise is the same work that a company needs to do when is analyzing the several routes it has when it knows what wants to be and to achieve. This means options like acquisitions, like technology investments, integrating more human resources, installing factories, and so, are examples of variables that need to be analyzed and weighted to compound the economic function cost of each route option and choose the best one to implement.



$$f(x) = a_1 * p1 + a_2 * p2 + a_3 * p3 - \cdots$$

$$\sum_{1}^{n} p_n = 100\%$$

$$a_n - variable\ economic\ vaue$$

Fig. 3- Economic function cost of strategy route options

The strategy implementation is the operational deployment details of the strategic route option that has been choose, which is normally known as the action plan of the strategy. This implementation plan needs to have the set of milestones and the key performance indicators, that will guide the confirmation acknowledge, during those years of implementation, of the control range if the company is being of the right path for the 3 to 5 years of the strategy definition plan. The milestones and key performance indicators will deliver the BHAG – Big Hairy Audacious Goals, introduced by Jim Collins and Jerry Porras (Collins and Porras, 1994), which means that a strategy will need to push for the overall company to achieve more, to higher its limits, and like those authors also refer the company has to leverage and develop their strengths to surpass to other level of competitive capabilities.

Digital and Information Systems Strategy

Once Stephen Hawking as said "The world has changed far more in the past 100 years that in any other century in history. The reason is not political or economic but technological – technologies that flowed directly from advances in basic sciences". This is an enforce of what is described in the previous sections of this article, that the business and the way companies are doing businesses is changing, and is changing fast and, each year, is being faster. There are several evidences that the technology adoption is pushing much faster the product or services consumptions than ever. An amazing infographic created by Nicholas Felton for the NY Times (Nicholas Felton, 2008) is an example of an artefact where it can be seen the speed of adoption of a set of common commodities like the electricity that took almost 30

years to achieve 50% of the US households and Internet took around 10 years, or that the telephone took more than 30 years to achieve those 50% of US households and the cell phone took just 5 years. But when we enter in in the digital world, the speed of the production of digital data growth starts to be even faster transforming the rates in exponential growths, because all the numbers "explode", meaning rates around 50x growth between 2010 and 2020 and 90% of that data has been produced in the last 2 years (Peter Ffoulkes, 2017).

These fastest times is consequently introducing changes in the marketplace, where the disappearance and rise of new companies is being amazing. As it can be seen in "Fig. 4 – Average Company Lifespan on S&P 500 Index – adapted from Innosight, Credit Suisse and other public sources marketplace change in the S&P500 index has been enormous. The lifespan of companies in that index in 1958 was 61 years and in 2012 was 14 years, with an estimated lifespan of 10 years in 2027 (Anthony et al., 2018; Michael J. Mauboussin et al., 2017; Mochari, 2016).

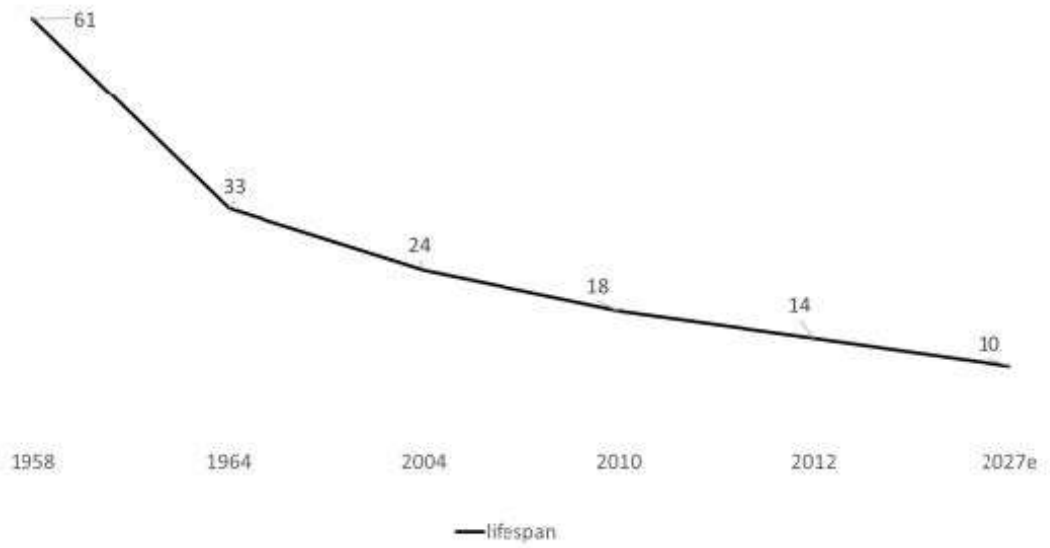


Fig. 4 - Average Company Lifespan on S&P 500 Index - adapted from Innosight, Credit Suisse and other public sources

The shrink of companies' longevity puts a pressure in the overall stakeholders, namely investors, which need to rethink even their valuation methods, portfolio sizing and capabilities new and traditional variables for a company to have a sustainable competitive advantage. This is quite important, because for instance Credit Suisse February 2017 Report identifies a quite good correlation between longevity and their innovation index (Michael J. Mauboussin et al., 2017).

The common challenge identified by several studies is the power of the present and near future digital disruption that is changing markets. That power is pushing operations to be efficient as they never have been, which means that technology needs to be present and correctly deployed, because only technology can help reengineering the existing processes in companies, can understand more deeply new digital interactions within the various channels. Market globalization and its global competition creation is a daily unknown challenge and a run for a wheel of continuous innovation speed, pressuring the product life cycles and existing business models. Basically, the term digital transformation is transversal to all industries value chains. And companies and leaders that understand it, are the ones that will prevail.

Several research analysts, like MIT Center for Digital Business, like McKinsey, Gartner or IDC, have common conclusions, namely that best digital companies are 26% more profitable than their industry competitors and generate 9% more revenues. Recently, a new pattern recognition of those studies have found that companies that are effectively using the new Data Science capabilities are more productive and profitable in 5% to 6% than its peers. (Anthony et al., 2018; CapGemini and MIT Center for Digital Business, 2012; Court et al., 2015; Kasturi, 2018).

Gartner predicts for 2020 that 75% of the businesses will be digital or are preparing to become digital (Mohammed Hashim, 2016). This understanding of becoming digital is a strategic first movement for companies to redesign their business strategy and culture. Basically, the appearance of a Digital Strategy Plan, beside the Business and Information Systems Plans, is starting to be understood as an essential tool for companies' future sustainability. This Digital Strategy Plans are the first steps for companies to understand how to convert digital value propositions of their businesses into revenuegenerating digital offers (Ross, 2018). Today, this means to create hybrid solutions (digital and physical) able to engage new experiences to customers. Experiences that can create a new emotional relations and new views of loyalty between the customer and the company, in a continuous operation. Today, methodologies of Design Thinking to understand customer needs and expected experiences with a continuous business applications development of the business and information strategies, based in DevOps methodologies, are essential to create competitive advantages and future value added for the stakeholders. Next figure represents the fit of this overall strategies.

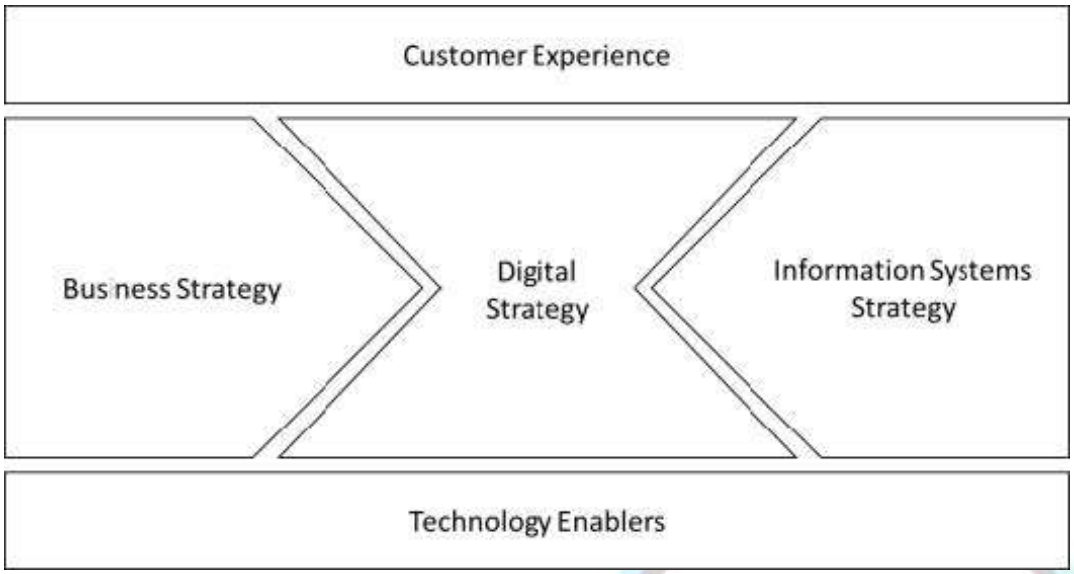


Fig. 5- Digital Strategy has the center of an Enterprise Intelligence

The previous figure represents, in fact, the reality of the new culture that has appeared: Digital Strategy as the center of an Enterprise Intelligence (Fig. 5- Digital Strategy has the center of an Enterprise Intelligence). It links technologies, namely the new disruptive trends of Analytics, IoT, 3D Printing, Blockchain, Natural User Interfaces, Artificial Intelligence, with Customer Experience, Business Strategy and Information Systems Strategy.

The digital strategy will deliver a digital governance, which is fundamental to define a clear responsibility of aligning digital strategy, policies and digital standards. A digital governance, when effective defined and implemented, will for sure help the development of a digital and agile business and sustainable company (Welchman, 2015).

Future research

This article permitted to identify a set of paths for deeper understanding of the digital business impacts, meaning that it is a basis for future researches like:

- Analysis of correlations of companies P&L growth, the existence of digital strategy, presence of formal CIO and CDO;
- Analysis of digital transformation (un)successful cases and the presence of the CIO or CDO roles;
- Analysis of digital framework strategy definitions, governance and implementation methodologies, to identify additional optimization processes;

Conclusions

With this conceptual article, it can be understood the impact that information systems have in the knowledge and business management inside companies, namely the creation of capabilities of leveraging data analytics able to understand deeper the value chain. Basically, these analytics intend to automate the Data, Information, Knowledge and Wisdom (DIKW) hierarchy, potentiate that managers and decision makers within companies are capable of maximize their business value generation. This means that, if a company is considered as a set of processes, a company by itself is a business model function where this DIKW analytics and virtuous continuous and interactive cycle of adopting strategic or tactic actions in the market, will analyze the impacts and reactions of the market. A manager or decision maker is then searching for its optimum market value function (OMV function).

The digital transformation of a company is in fact a process reengineering inside the companies, adding technologies that will create a vision of “real time” everywhere in the value chain and will run as an automation authority, creating additional efficiencies and competitive advantages (OMV function optimization).

This trend of digital transformation, to get the OMV function optimization, is changing the way that companies understand its core strategic activities. What Michael Porter (Porter and Millar, 1985) has structured as a set of Inbound Logistics, Operations, Outbound Logistics, Sales & Marketing and Post Sales services activities, is changing with the need to incorporate Information Systems as a core and strategic activity of the enterprises value chains, because Information Systems are more than the “old and only” Information Technologies. In reality, an Information Systems is the set of people, processes and technologies! Information Systems are fundamental to address the strategic optimization of the automation and efficiency transformation within a company. This means that when a company is building a business strategy, needs today not only to create, but fundamentally to assure the right alignment with Digital and Information Systems strategies.

It is a fact that the speed of new technologies appearance can create market disruptions and add continuous pressures to existing markets status quo. The most adaptive and digital companies, according to several studies, are 26% more profitable than their industry competitors and generate 9% more revenues, which represents an output of the intentions this article conceptual terms. The future challenges are to understand the several steps and variables that comply a set of best practices strategies that can transform the duo “data and information” basis in a digital and business optimized company.

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An Integrated Model of Business-Knowledge-Digital – The BKD Link: Innovating value in a digital journey

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Introduction

The shift of technology landscape towards cloud computing, artificial intelligence, enhanced mobile broadband and devices has had a significant impact on all kinds of businesses. This evolution has been a catalyst of change across countless digital ecosystems. To create competitive advantage in a digital market, organizations are digitalizing products and services; and creating new digital relationships with peers, customers, suppliers and business partners. Business leaders seek transformation of the way they do businesses, to change the structure of competition, to redefine business strategies, adopt new systems, tools and mindsets to run their business and to enrich their organizational culture. Managing internal capabilities across business-knowledge-digital dimensions in an organization must be prioritized. Business owners can associate knowledge management and digital strategies to set business strategy and vision.

Digital Transformation is the unique confluence of data, advanced analytics and innovation (Gudergan, G.; Mugge, P., 2017). This transformation drives the needs of change inside an organization, for instance, to change the basic pattern of how an organization can create value, motivate employees and interact with different stakeholders in order to perform better and control costs.

The aim of this paper is to present an integrated model of business strategies by incorporating three key initiatives: organizational knowledge, business strategies, and digital capabilities, for addressing the challenges of digital transformation. It is demonstrated through adopting the model of Knowledge Strategy Framework developed by (Zack M.H., 1999). This framework suggested how an organization could bridge the knowledge and strategic gap and prepare itself for aggressive competition. Based on this framework, a new segment with digital strategy elements has been added to reinforce the model to cope with the shifting digital economy of the past two decades. Not only are knowledge and strategy gaps considered, fulfilling digital capabilities and resources to support a digitalization journey can be aligned.

The paper first reviews the development of Knowledge Management and Intellectual Capital for aligning the concepts of knowledge practice and knowledge dynamics. The model of Knowledge Strategy Framework will be slightly elaborated in terms of knowledge-strategy gap analysis. The paper will then will describe the development of digital transformation and business digital strategy. An integrated model of Business-Knowledge-Digital Link will be introduced and discussed as a reference for an organization to start its digital journey. Finally, the paper will present a discussion on highlighted limitations, recommendations for future research and conclusions.

Knowledge Management and Intellectual Capital

Knowledge Management (KM) and Intellectual Capital (IC)

Business organizations possess various forms of tangible and intangible resources. Organizational competences and capabilities must be regarded as valuable strategic resources, as they can be used to drive change and transformation in a learning organization. In recent decades, much research has been

conducted in academic and business/industrial sectors to drive value creation through Knowledge Management (Nonaka, 1991, 1994), Tacit Knowledge (Nonaka I. & Konno, N., 1998; Nonaka, I. & Toyama, R., 2003) and Intellectual Capital (Edvinsson and Malone, 1997; Spender, et al., 2013). Knowledge Practices including knowledge-based processes and management activities in a firm have also been discussed in the study of Knowledge Management for creating values and raising competitiveness (Lee, H. and Choi, B., 2003).

Kianto, A. and Ritala P. (2014) noted that IC literature examined the intangible resources in an organization while KM literature addressed the mechanism by which these resources could be controlled and managed. They proposed four models concerning the interaction of IC assets and KM practices in terms of moderation and mediation and their impact on organizational performance. This has given an insight on the interlinks in between IC (company assets) and KM. Traditional IC assets can be classified as human capital, functional/structural capital, and relational capital. The need to review the nature of these assets may be reinforced or even transformed by digital initiatives and evolving elements like data, analytics, innovation and knowledge. How far should an organization go to make use of its existing resources to transform its digital capabilities? This is a question that every modern organization must ask itself.

Edvinsson and Malone (1997) defined IC as "the possession of the knowledge, applied experience, organizational technology, customer relationship and professional skills that provide an organization with competitive edge in the market". It aims at making good use of an organization's existing intangible and knowledge-based resources to create value in its production and business operations.

As mentioned, the basic three IC elements are human capital, functional/structural capital, and relational capital. Kianto, A and Ritala, P. (2014) stated that these types of capital relate to human skills, expertise and motivation; the structural features of production embedded in organizational processes, systems, databases, patents and IPs; and those relationship networks among employees, customers, suppliers and potential business partners. It is hard to represent relational capital in terms of business profits or performance without a deeper understanding of the whole process, internally and externally. Mayer, R. C.; Davis J. H.; Schoorman, F. D. (1995) pointed out that trust is embedded throughout an organization's internal and external relationships.

Erikson (2002) suggested that any forms of competence and commitment related to entrepreneurial activities in an organization should be considered as a kind of intangible asset. Kianto, A. and Ritala, P. (2014) further noted that a broad definition of IC had developed, and intangible assets had evolved subject to the rapid changing of technologies and customer demands. These developments have not been limited to the explicit outcomes of knowledge-intensive work, such as formula, patent, etc. It is also necessary to have good leadership by senior management and front-end managers to make sense of the actual situation in terms of business development and market conditions in order to react flexibly and responsively to new business realities.

Intellectual Capital Research

Intellectual Capital research has played a major role in studying the value creation of organization and evaluating IC impact on the modern business management model. Three distinct stages of IC research development have been defined since the late 1980s. The first stage focused on the importance of intellectual capital by defining a framework for it. Researchers aimed at making invisible IC more visible by constructing IC guidelines and standards (Guthrie, J., Ricceri, F. and Dumay, J., 2012). Leif Edvinsson began his IC research in Sweden in the early 1990s. He found that since there was an implicit focus on the transformation from an industrial economy to a service economy, the economy depended on intangible assets and on the quest for an alternative value logic other than hard assets. These findings

emphasized the importance of defining the intellectual capital held in an enterprise or an organization (Edvinsson, 2013).

Guthrie et al. (2012) proposed that the second stage of IC research could be defined as a stage where approaches to measuring, managing and reporting IC to incorporate it into a formal business status representation, for instance, in a company's annual report. Different methods of IC evaluation have been introduced and discussed to help evaluate organizational assets in monetary or other means to gain understanding of an organization's potentials or capabilities (Dumay, J. and Garanina, T., 2013). Dumay and Garanina (2013) pointed out that under Guthrie's research the third stage of IC research was emerging and characterized by research critically examining IC in practice, devoted to the managerial implications of how to use IC in managing a company. Guthrie et al. (2012) stated that IC research has shifted its focus to how organizations understand, adapt and apply IC as a management technology so as to provide a better view of IC's impact, rather than just producing IC measures.

The fourth stage of IC research is more recent. In this stage, researchers hope to extend IC's boundaries into wider ecosystems like countries, cities and communities, as opposed to specific firms (Dumay and Garanina, 2013). Discussions about the implications of IC reporting have been raised, concentrating on how an organization discloses what was previously secret or unknown, so that all stakeholders understand how the organization considers its ethical, social and environmental impacts. It seeks to understand IC's impact on society and environment (Dumay, 2016). This requires a sustainable system in a healthy organization with IC practices. Dumay (2016) suggested linking IC practices with "value-creation" instead of wealth creation. He defined value in four ways: 1) monetary, 2) utility, 3) social and 4) sustainable. This has given an insight for IC researchers to rethink how to create bridges between the knowledge inside the organization, balancing stakeholder needs with a wider eco-system in a broader set of intangible assets associated with a knowledge economy (Secundo, et al., 2018).

Knowledge Dynamics

Nonaka and Takeuchi's SECI model of knowledge dimensions (1991) is a model of knowledge creation that explains how tacit and explicit knowledge are converted into organizational knowledge. The SECI model distinguishes four knowledge dimensions – socialization, externalization, combination, and internalization – which together form the acronym "SECI". This was a breakthrough in describing the tacit knowledge that is embedded in the organizational processes delivered by workers/employees and how that knowledge is transferred and shared. By working out the SECI model within an organization, tacit knowledge can be captured, transferred and reinforced in a form of a Knowledge Spiral in an organization. This facilitates knowledge creation by the four modes of knowledge conversion and dissemination throughout the organization. It is a process of interaction between individuals and it is enhanced by the involvement of groups, organization and the environment.

The key concept of the SECI model of knowledge creation was based on the continuous dynamics between tacit and explicit knowledge (Bratianu, C., 2015). It could be facilitated by encouraging conversations, dialogue and practice between individuals. He pointed out that Nonaka emphasized dialectical thinking, which is a powerful tool in transforming tacit knowledge into explicit knowledge during the process of production or operation. This would facilitate conversion among people from different areas, cultures and expertise within an organization, something especially important within an international enterprise. Collaboration would be regarded as a key skillset in an agile organization, as it can help to raise the responsiveness of team workers to changing markets while saving resources for another projects. Therefore, knowledge creation can benefit if an organization can provide an environment for internal social engagements to generate ideas and innovation and to enrich organizational culture.

(Bratianu, C., 2015) explained that knowledge assets constitute the outcomes of the knowledge creation processes that were embedded in the resources and capabilities of the organization according to the Nonakian dynamic model of knowledge creation. The assets could be represented as structural and relational capital of an organization. More emphasis should be placed on the flow of knowledge between different working levels within an organization. Knowledge sharing and creation should be facilitated given a flat communication layer of different organizational levels.

Knowledge Strategy Framework

Having reviewed the fundamental concepts of IC and KM in the last section, it is clear that the interaction in between IC and KM helps an organization to position itself in the market share and to further explore where it should go. A proper strategic grounding in knowledge creation and organizational capabilities would help an organization to adapt to new business environments in the digital era. An organization must have a good understanding of the link between knowledge and strategy in conjunction with making good use of its human, structural and relational capital. This is also a challenge for the business owner or senior management in forming business strategy and enhancing organizational performance.

Zack, M. H. (1999) considered that leveraging resources and capabilities across many markets and products is important and this tends to become the strategic driver for the business growth. He also explained that competitive advantage based on resources and organizational capabilities was potentially more sustainable than that based on product and market positioning. He suggested "knowledge can be considered the most important strategic resource and ability to acquire, integrate, store, share and apply it the most important capability for building and sustaining competitive advantage" (Zack, M. H., 1999, pp. 128). From this conclusion, it is easy to understand that organizational knowledge, whether explicit or tacit, makes an organization uniquely positioned to form knowledge-based competitive advantage. The culture of learning will develop as the organization strives to use its learning experience to build on and to set new strategies for market adaptation.

Knowledge and Strategy Link

Zack, M. H. (1999) reviewed the linkage of knowledge and business strategy within an organization. He stated that each firm should understand its knowledge and the knowledge it needs in order to raise its competitiveness when considering any obstacles or limitations it faced, using known knowledge and competence requirements to select an appropriate strategy for its positioning in the market. He suggested three kinds of knowledge: core, advanced and innovative, categorized by ability to support a competitive position. Core knowledge was the minimum scope and level of knowledge required just to "play the game" in the market/industry. Advanced knowledge enabled a business to be competitively viable and to differentiate itself from its competitors. Innovative knowledge enabled a business to lead in its industry and stay ahead of competitors, sometimes even to change the rules of the industry. It would help to deliver comprehensive solutions to its customers to raise their loyalty and to prepare the organization for change in dynamic business environments.

A Knowledge Strategy Framework

A business must be able to identify any gap between what it must do to compete and what it is actually doing, as this represents a strategic gap in an organization. In previous management theory, SWOT analysis was widely used to evaluate the status of an organization. Once knowledge-based resources are subjected to KM and IC initiatives, knowledge gap analysis can used to see any possible misalignments. Zack (1999) presented a strategic gap model to explain the importance of knowledge strategy linking and to interpret how this model could drive a firm's competitive strategy. He emphasized that this kind of framework should be described along two dimensions to reflect its degree

of aggressiveness. The first dimension was the degree to which an organization tended to increase its knowledge in a particular area; the second addressed whether the primary sources of knowledge were internal or external.

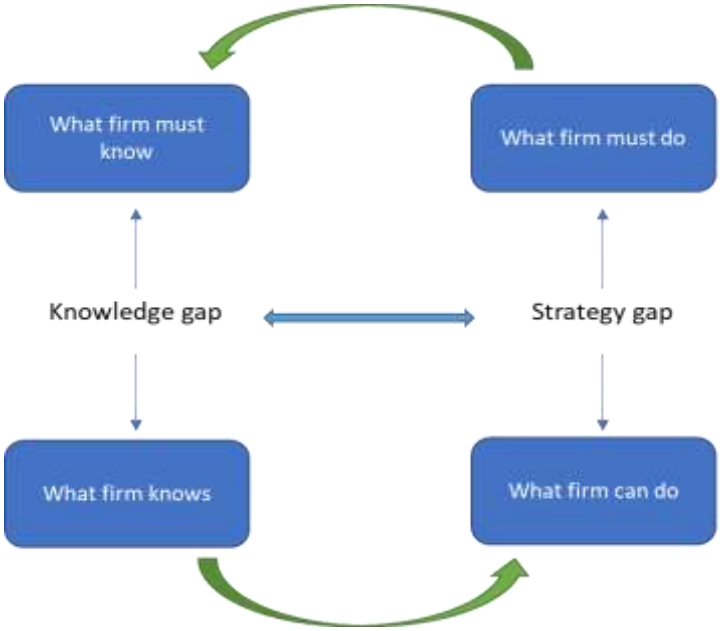

Fig. 1 Knowledge-Strategy Gap

This model can help an organization to execute an appropriate strategy to close the knowledge gap, to create new knowledge or to defend its position based on its levels of knowledge. Zack, M. H. (1999) explained that this kind of analysis was "exploration vs. exploitation". It aims to guide an organization to be an explorer, to create or acquire knowledge and to remain competitive in its strategic position. On the other hand, when knowledge resources and capabilities exceed the requirements of a competitive position, the organization can further exploit this knowledge platform to expand its market penetration. "Exploration provides the knowledge capital to propel the company into new niches while maintaining the viability of existing ones. Exploitation of that knowledge provides the financial capital to fuel successive rounds of innovation and exploration" (Zack, 1999, pp.137). Knowledge transfer capability could be a key strategic element for an organization to establish a balance in between exploration and exploitation.

Another way to orient knowledge strategy was suggested, to evaluate an organization's primary source of knowledge. It is normally assumed that business knowhow and skillsets are stored in employees' heads and that processes must be developed and recorded in procedures or stored in internal databases. If an organization lacks certain knowledge, it can be acquired externally. This is a feasible short-term solution, but it may be expensive. Sometimes, an organization may build partnerships with universities or government agencies to extend its research projects with long-term and sustainable development prospects. This is a strategic decision that an organization must consider. Various business strategic decisions, such as acquisition, merger or alliance, can also enrich knowledge resources. It is necessary to evaluate the current knowledge-strategy gap in an organization before deciding on taking an aggressive or conservative approach to acquiring knowledge.

Digital Transformation and Business Digital Strategy

Digital Transformation is impacting every level of society, every type of business and industrial sector, and driving the development of innovation and creativity in organizational sustainability. It has been a significant change in the basic pattern of how an organization creates value in terms of its underlying mindset, systems and tools needed to reposition the entire business (Gudergan, G.; Mugge, P., 2017). What are the essential elements and business models required for an organization to meet the changes of modern business environments? An organization must be willing whole-heartedly to reform, to envision its long-term strategic digital opportunities and to be open to iterating and refining solutions along the way, all of which is highly dependent on its resources and capabilities. Organizational capabilities are a key success factor for an organization to prepare for its digitalization journey. The organization must focus on how it can transform internal capabilities into digital capabilities to cope and compete in the changing business environment.

In the above sections, KM and IC pathways have been discussed to explain the use of organizational assets/resources, whether in tangible or intangible format, and to identify an organization's strengths and weakness in terms of knowledge-based processes/practices. This helps in planning initiatives to prepare an organization for the rapid development of business environments as a fundamental concept of forming organizational capabilities. The entrepreneur or senior management may consider creating new organizational structures within corporate boundaries in which new processes can be developed, including spinning out an independent organization from the existing organization or acquiring a different organization whose processes and values closely match the requirements of the new task. All these strategic decisions require visionary leadership and a thorough understanding of an organization's resources and knowledge. Having sound knowledge management practices in line with strong intellectual capitals are important in leading an organization to adapt to new and potential digital-driven markets.

Digital Disruption and Sharing Economy

Before we further elaborate the development of digital capabilities, it is necessary to understand digital disruption and the sharing economy. The business world is undergoing rapid digital evolution, and many businesses are breaking down barriers or creating new opportunities while seeing previously successful business models diminish. New forms of business ecosystem are being nurtured to facilitate to strengthen customer relationships, and these changes can have a great impact on the survival of traditional businesses. Small-scale disruption is acceptable if the existing business ecosystem is helped by new ways of doing business or better able to meet the demands of new consumers who expect faster response and new services, to engage customers digitally and to improve cost performance. However, this disruption also poses a threat to businesses that cannot adapt to the rapid pace of technological change to meet customers' needs. Business leaders anticipate significant impacts on both revenue and competitiveness from digital disruption (Weill, P.; Woerner, S. L., 2015).

Organizations should act quickly to ride the wave and to capture some of the value created by their industries' evolution, to reallocate resources from digitally threatened assets to more digitally interesting ones, to automate processes and to adopt IT capabilities to deliver rapid results, and to optimize legacy capabilities to support traditional business operations. Catlin, et al. (2015) said businesses could boost the effectiveness of existing operating models through digital approaches/tools, make use of data to respond quickly to market changes or customer's needs, and better create connectivity between brand and customers when it is ready for the digital era.

Digital Capabilities and Dynamic Capabilities

Digital transformation is an ongoing process that requires an organization to expand its focus beyond solely considering technologies. The organization must also include other internal capabilities to succeed (Carcary, et al., 2016). The digitalization journey requires a digital capability approach with the dynamic capabilities. These were defined by Zahra, et al. (2006) as "the ability to manipulate or re-configure the capabilities an organization's existing capabilities". Therefore, an organization could leverage those of its capabilities that are potentially relevant to a digitized business landscape so as to remain competitive in the market and continually to equip itself with good digital talents and skills.

Selecting the right team or talents and forming an appropriate organizational structure to facilitate innovation is crucial and requires good judgement, the right resources, processes, and values. The factors that define an organization's capabilities and disabilities evolve over time. Mostly, the managers start to review the resources, to articulate processes and values and to migrate finally to culture. When the organization's capabilities reside primarily in its people, changing capabilities to address new challenges is relatively simple. But when capabilities have come to reside in processes and values, and especially when they have become embedded in culture, change can be extraordinarily difficult (Christensen, C.; Clayton M.; Overdorf, M., 2000). Carcary, et al. (2016) pointed that dynamic capabilities were not easily replicated but were necessary for an organization to adapt to new opportunities, to develop new products, services and processes, to implement value business models and to shape the business ecosystem. They identified several key capabilities, other than IT capabilities, of a digitalized enterprise. The key capabilities are; promoting and embedding an agile digital culture, developing effective digital leadership skills, building digital talent and defining a transformative digital business strategy. Therefore, the link between organizational capabilities and digital strategies is necessary. Organizations need to construct business strategy models suitable for incorporating digital capabilities, strategies and talents into existing knowledge practice.

Digital Skills Development

Building digital skills can fill part of the digital gap as a short-term solution, but more important is to have a clear digital transformation plan to meet business needs and satisfy customer expectations. A roadmap for successful digital skills development must include four essential steps: 1) to define vision and identify future skill requirements, 2) to undertake skills gap assessment, 3) to bridge the skills gap and 4) to constantly evaluate progress (Spitzer, B.; Morel, V.; Buvat, J.; Subrahmanyam KVJ, 2013). In order to meet the digital transformation goal of an organization, management must first define the extent to which it is willing to be digitalized and to undertake skills/capabilities assessments by evaluating the digital proficiency of its employees.

Digital talents are a critical success factor when an organization wants to pursue any digital goal. Management should be able to determine the digital strategy in order to overcome the skills gap and to foresee the future development plan as a whole to become a digital enterprise. It is also important to ensure constant progress of its development plan and to monitor the outcome of each stage in the digital journey. This roadmap echoes the key capabilities stated by Carcary, et al. (2016). Development of digital leadership skills include emphasizing leadership capabilities incorporating a customer-centric focus, business and team management experience, leadership skills and a deep understanding of social technologies. The right balance of digital talents to deliver a digital strategy is vital to digital transformation. Digital culture must permeate an organization to promote creativity, agility, risk-taking and design thinking. Digital people strategy should be in place to locate, recruit and retain talents and to develop digital skills from the existing workforce in digital initiatives (Strack R., Dyrchs S., Kotsis Á., Mingardon S., 2017).

Carcary, et al. (2016) stated that a digital business strategy represented how an organization could leverage digital resources to create differential value. IT strategy was perceived as a catalyst for digital transformation, but the key success factor was how IT strategy aligned with the organization's business strategy. Developing a digital business strategy should completely integrate IT strategy with business strategy by bridging the digital and strategy gaps. Identification of business opportunities and threats should not be neglected, as it requires an organization to define its digital opportunities in the early stage of digital transformation. The deployment of IT should not be limited to technology development, but to leverage data/analytics/innovation assets and capabilities for operational and strategic purpose in a digital enterprise (Peppard, 2014).

In considering embarking on a digital journey, an organization must define its current digitalization position in terms of organizational capabilities and resources. Digital transformation will have a major impact on modern business in every economic environment. How an organization plans its digital transformation will be critical to its digital journey regardless of the nature of its business. In the next section, an integrated model of business-knowledge-digital will be introduced and discussed. This business model should give insights into taking account of digital gaps and highlighting the importance of evaluating digital opportunities and resources. This would be a useful tool or starting point for an organization to evaluate its position in digital transformation and to set digital strategies to raise its competitiveness.

Integrated Model of Business-Knowledge-Digital – the BKD Link

The integrated model of BKD link is a strategic systematic model developed to elicit organizational intangible knowledge to incorporate into competitive organizational strategies. This model comprises of three main segments: Knowledge Strategy, Business Strategy and Digital Strategy. In each segment, identifying and bridging the gap are key tactics to identify barriers between the ideal and the actual situation within an organization. It states the importance of cohesive and interactive links across knowledge, business and digital strategies.

The following diagram shows the BKD model in conceptual framework. Detailed descriptions in contexts or dimensions of knowledge-business-digital link will be introduced in the next sub-section.

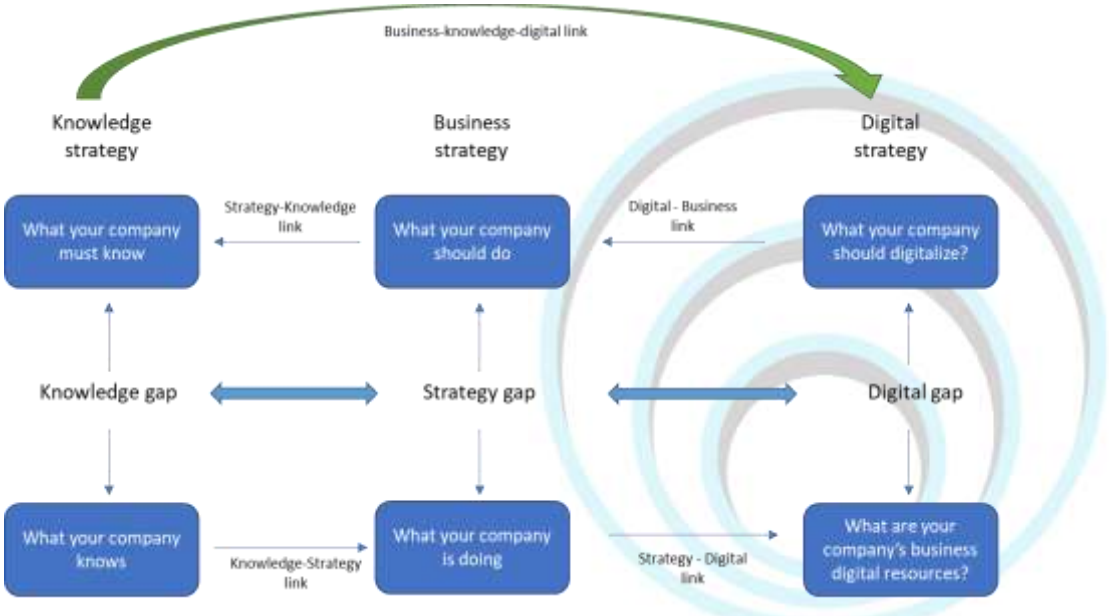

Fig. 2 The Integrated Model of Business-Knowledge-Digital Link - Conceptual framework

In the Knowledge Strategy segment, the organization sets a vision for long-term goals through knowledge exploitation, value creation and innovative predictions (Zack, M. H., 1999). In the Business Strategy segment, the business leader sets a mission and value proposition to lead long-term / medium term / short-term goals, in order to construct an action plan to develop and adjust the competitive advantage of an organization. Zack's model has set the foundation of the knowledge-strategy gap to define what knowledge and skills to retain or to develop.

In the Digital Strategy segment, the organization digitalizes business strategy with the enablement of technologies and establishes a digital ecosystem to fulfill market demands in the emerging digital economy. Digital ecosystem refers to building a digital business connecting with an efficient digital society. Digital strategy, a form of strategic management, helps a business respond to a digital question and to make use of IT to change the shape of the business, in terms of business strategy, business model, operating model and/or technical capability (Aron, 2017). Digital gap sets the targets to be fulfilled by the digital capabilities and resources, utilizing the intellectual capital of the organization. Cross-linking capabilities across three-dimensions defines the positioning of the organization. Cross-linking strategies and components across three-dimensions can inspire value creation and formulate metrics for better performance.

The contextual components of the BKD Link

The conceptual framework has given an overall picture of how the model in terms of business, knowledge and digital initiatives should be constructed. An organization needs to know its existing status, for instance, in the leading, maturity or developing stages, to evaluate its market competitiveness and its potential development.

Linking BKD segments is proposed to bridge the gaps and to fulfill the needs of a company and to answer questions such as: What the company must know? What the company should do? What the company should digitalize? Gaps are elaborated at three levels – Vision, Modelling and Capabilities. Strategy sets the vision of business; Model Canvas visualizes the strategic elements; whereas, capabilities tells what the company knows. Bridging capability gaps between strategic elements and capabilities inspires innovation and improves operating efficiencies. Integrating BKD Model Canvas lays out the approach to achieve business goals. With corporate strategies and priorities clearly defined, the digital transformation roadmap can be derived.

The following diagram illustrates the components of the BKD Link model:

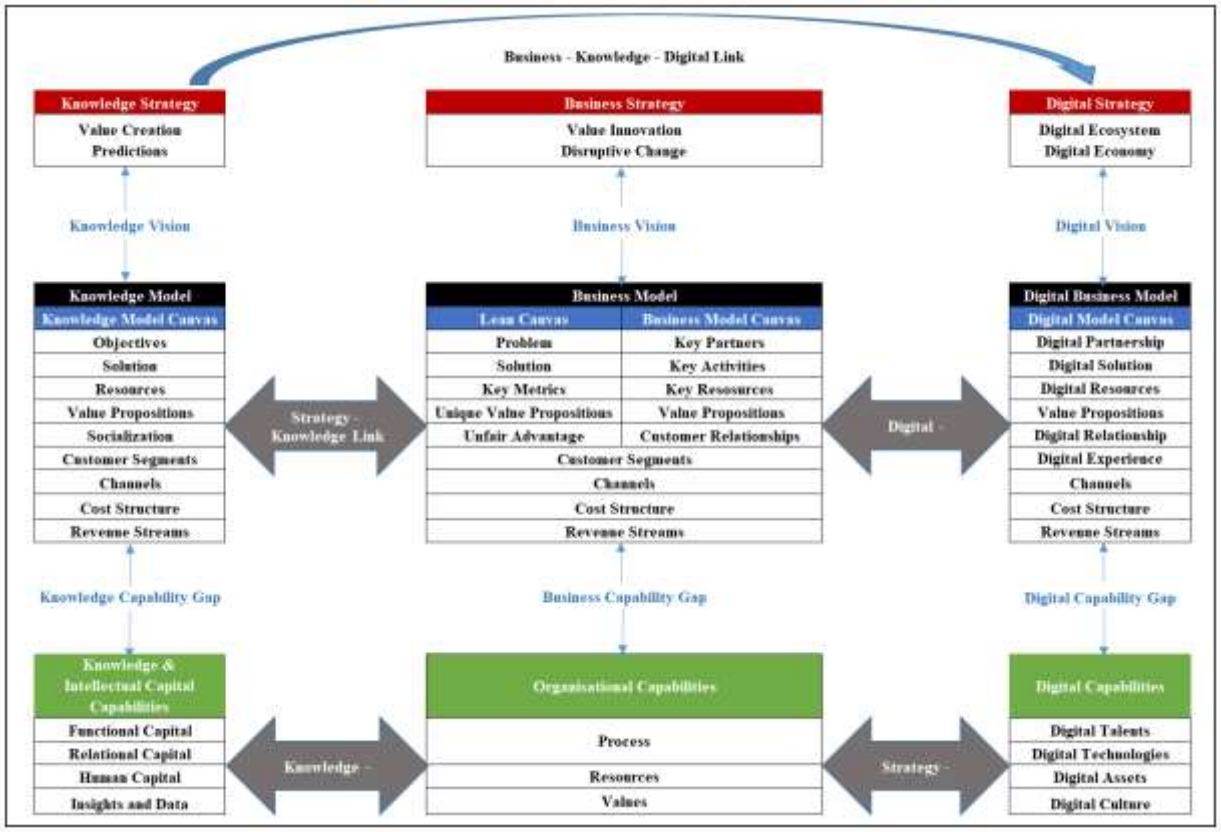

Fig. 3 The Integrated Model of Business-Knowledge-Digital Link – Contextual/Dimensional Components

This model proposes Knowledge Model Canvas (KMC) as a strategic extension for the Lean Canvas, whereas Digital Management Canvas (DMC) serves as an extension to the Business Model Canvas (BMC). KMC is built on a knowledge-based framework. The DMC emphasizes extending digital capabilities and opportunities in knowledge management and business models. 'A business model depicts the content, structure, and governance of transactions designed so as to create value through the exploitation of business opportunities.' (Zott & Amit, 2010). Business model refers to the logic of the firm, the way it operates and how it creates value for its stakeholders. The Business Model Canvas (BMC) is introduced to visualize modeling at a strategic level with a common language and representation (Fritscher & Pigneur, 2014). This strategizing process is seen as a design activity, which involves generation of ideas and their validation.

By adopting BMC, it can "make tasks easier and quicker, while revealing as-yet-unseen opportunities" and it helps to visualize what sorts of key attributes. (Osterwalder & Pigneur, 2013). BMC uses nine building blocks to represent a business model. These building blocks can be further grouped into four perspectives. The main perspective is the offer (what we do), advocate customer-centricity (who we do it for), associate with the activities (how we do it) and the financial profit (how much?). A lean canvas was later developed and emphasizes problems, solutions, key metrics and unfair advantage (Lago, et al., 2017). Lean canvas is suitable for agile culture and is associated with the agility of knowledge model canvas, which should operate on rapid operation and light infrastructure. BMC is suitable for end-to-end delivery, which can couple with DMC, that is built on high-end infrastructure and processes.

Digital Model Canvas is proposed to visualize the building blocks of digital strategy, cohering with the structure of BMC. Digital partnerships and digital resources are highlighted to address the shift of digital

talents. Value proposition, digital relationship and digital experience drive the digital marketing strategy. Operating model and service platforms differentiate the cost and revenue structure. Thoughtful digital leadership can cultivate a digital culture and maximize capabilities of digital assets, technologies and talents throughout organizational values, process and resources.

Knowledge Model Canvas is proposed to contextualize knowledge management strategy, in line with lean canvas. Value proposition and objectives of knowledge management solution need to be clearly defined. Resources and channels can be socialized to support the knowledge management solution. Channels and customer segments define target customer experience and create opportunity of uncontested market. Investment decisions shall be based on profit enhancement and revenue from new revenue streams. Effective coupling of knowledge and intellectual capital capabilities with organizational capabilities, such as functional-process, relational-process, human-resources, data-resources and value-innovation can accelerate the business strategy.

Studies of knowledge-business link and digital business link will be further introduced and discussed.

The Knowledge – Business link

Efficient knowledge management, enabled by cognitive computing and artificial intelligence technology, will become mainstream to lead business decisions in the digital era. An integrated strategy can institute a knowledge management-driven culture to lead business strategies via digital transformation.

Digitalized business insights and analytics, either derived internally within an organization or benchmarked against external markets, allow conversion of tacit knowledge from bulk customer data or market responses into explicit customer journeys and behaviors. Organizations should strengthen the links between customer behaviors, intellectual capital and business strategies when adopting new technologies and business models. Organizations must put effort into associating their own IT or digital capabilities with knowledge management practices to influence innovation within the organization.

Traditional Knowledge reservoirs can be managed by deep learning and robotics process automation (Argote & Ingram, 2000). Taxonomy and Ontology management can be empowered by neural networks. Chatbots/intelligent agents can lead dialogues and engagement. Advanced knowledge management practices like dialectical thinking, predictions and exploitation can be handled by dialectics agent and cognitive computing and insights.

Digerati can leverage powerful computing technologies to understand customer segments, explore new markets and opportunities. Digital leadership and digital skills are key to driving digital value propositions to create digital ecosystems, generate profiles from shared economies in the digital economy market. The table below shows the association of KM practices with emerging digital capabilities.

Knowledge Management Practices	Kind of knowledge (Zack 1999)	Artificial Intelligence and Cognitive Computing
Knowledge reservoir	Core	Deep learning and robotics process automation
Taxonomy and ontology	Core	Neural network
Dialogues and engagement	Core	Chatbots / Intelligent agents
Dialectical thinking	Advanced	Dialectics agent
Predictions and exploitation	Innovative	Cognitive computing and insights

Table 1 Empowering knowledge management by artificial intelligence and cognitive computing

The Digital – Business link

Digital-Business link is a crucial strategic alliance of digital and business strategy. (Veit, et al., 2014, pp. 48) defined digital business model as "changes in digital technologies trigger fundamental changes in the way business is carried out and revenues are generated".

Business strategy refers to what markets to serve, strategic business posture, how to define the differences between organizations and how to compete on the basis of competitive advantage (Mintzberg, H.; Quinn, J. B., 1991). Disruptive innovations and value innovations strategies are leading strategies in the digital economy. Disruptive innovations create an entirely new market through the introduction of a new kind of product or service, including those which appear worse, initially, as judged by the performance metrics that mainstream customers value. (Christensen, C.; Clayton M.; Overdorf, Michael, 2000). Value innovation strategy, developed by Blue Ocean Strategy, is a cornerstone of market-creating strategy which focused on a leap in value for both buyers and the company (Chan Kim W.; Mauborgne, R., 2005). There should be an equal balance of value and innovation as innovation could lead an organization to explore new markets to create value by overestimating the expectation of the buyers. While value to buyers comes from the offering's utility minus its price, and because value to the company is generated from the offering's price minus its cost, value innovation is achieved only when the whole system of utility, price and cost (value-cost) is aligned.

Disruptive technologies influence the growth of digital economics by creating new value across economies and borders. Digital strategies generate business value by transforming digital capabilities, establishing digital ecosystems and creating opportunities in the digital economy. Digital capabilities, such as broadband, cloud, IoT, big data and AI, improve intelligence in organizational operation, business and management processes. As a result of enhanced productivity and connectivity, breakthroughs in the value-cost link can be realized. Successful linkage of business, knowledge and digital segments inspired concepts of digital ecosystems like smart cities, intelligent customer journey mapping and patient journey analysis, etc.

Discussion and Conclusions

The BKD Link integrated model has given an insight to how to associate organizational knowledge, resources and capabilities to raise organizational agility. It emphasizes reshaping or reforming business models to maintain competitiveness in a new digital era. This integrated model enhances the readiness of an organization to transit into digital transformation. This model offers an awareness of the inter-relationship of knowledge, resources and the business model as a whole for an organization and encourages business leaders, entrepreneurs and senior managers to leverage knowledge management capabilities to lead business and digital strategies in the new digital era.

(Carcary, et al., 2016; pp.26) pointed out that the key challenges in moving to digital was that how an organization could be prepared by continual adjustment during the digital transformation and evolve into "a new modus operandi – as digital transformation needs to be executed with urgency, agility and in incremental steps". According to the BKD Link model, it has clearly dissected the key building blocks of KMC, BMC and DMC, which represents a new form of business strategy model. This framework suggests dimensions of each segment to allow organizations to understand how to evaluate their status by doing gap analysis in terms of the attributes under each strategy segment in the model. This can be a tool to measure the readiness for digitalization in fulfilling the requirements of a digital business strategy. This would be a foundation to any digital transformation that an organization needs to initially focus on to see its readiness of getting ready for its digital journey.

The authors aim at showing not only technologies or digital capabilities as the integral part of digital transformation, the BKD integrated model presents a prerequisite for an effective organizational digital transformation journey in terms of knowledge-based resources, knowledge management practices as well as transformative organizational culture and agility. The model has developed the building blocks in each strategy segment to analyze the agility and openness to change in order to complete the transformation. It has also established a framework to provide an organization with a thorough understanding of its status from strategic and operational levels. Each level of a business analyzes its readiness to be digitalized, to determine how to align the requirements of digital transformation with the whole of the organization. The enterprise mindset should come first to see if the organization is ready for behavioral change in adapting to the changing business environment, to establish a digital talent team developing a holistic view of digital transformation, to determine the right digital capabilities to support transformation and to align with other key internal disciplines to ensure the success of the digital transformation journey.

This paper presents a review of the pertinent literature and conceptual knowledge-strategy framework with additional contribution on adding digital initiatives for reshaping a business model strategy. It provides the authors' analysis of the literature and explanation of an integrated model of linking three initiatives: knowledge, strategy and digital. The key limitation of the paper is its conceptual and theoretical nature. Further empirical research should be carried out subject to the suggested model to review organizational competence at different stages of digital transformation and to assess the readiness of starting any transition. The key future research direction concerns further conceptual and theoretical work on the interconnections of these three BKD initiatives on a different scale of operation levels within an organization or as a tool to perform a benchmark analysis among competitors in the market. Refinement on the model can result if the model is applied to different kinds of contexts and tested empirically based on different business environments.

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Mapping sustainability transitions in contemporary culture

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1. Introduction

Between the early 1970s and the late 1990s, postmodernism was a dominant cultural paradigm. The critique of modernism and modernity itself presented by authors associated with or close to postmodernism, range from Foucault's propositions on regulation and surveillence (Foucault, 1966, 1975) and Derrida's deconstruction (Derrida, 1967) to Fukyama's theory of the End of History (Fukuyama, 1992). Postmodernism emerged in architecture (Lipovetsky, 2004), with the writings and designs of Robert Venturi and Denise Scott-Brown, in emblematic books such as 'Complexity and Contradiction in Architecture' (Venturi, 1966) and 'Learning from Las Vegas' (Venturi et al, 1972).

Despite its dominating influence in late capitalist culture (Jameson, 1991), postmodernism has been slowly withering in the past decade (Falck, 1989; Paglia, 1992; Wallace, 1992; Hutcheon, 2002; Kirby, 2006; Rudrum and Stavris, 2015). The new cultural paradigm is generating a variety of definitions, which is symptomatic of its complexity (Rudrum and Stavris, 2015). Descriptions and synthesis of the current cultural moment contriute to enlighten the values of this time in Western history, but also, we suggest, to ascertain indicators to evaluate society's sustainability. These propositions date back to the 2000s, the beginning of the new millenium, a time of market deregulation, national economic inequalities, systematic democratic failures, radically new communication technologies, major crisis and shifts in the world economy and growing awareness of human pressures on nature (Lipovetsky, 2004; Kirby, 2009; Vermeulen and Van Den Akker, 2010; Tibbs, 2011).

In the twilight of postmodernism, 'The Charter of New Urbanism' presented an urban diagnosis marked by pressing urban issues, including

> *'the placelessness of modern suburbs, the decline of central cities, the growing separation in communities by race and income, the challenges of raising children in an economy that requires two incomes for every family, and the environmental damage brought on by development that requires us to depend on the automobile for all daily activities' (Poticha, 1999, 1).*

New Urbanism emerged as a sign of hope for spatial planning (Talen, 2005), given its emphasis on sustainability, following the official UN charter (UN, 1987). In architecture, the Pritzker Prize was awarded to Renzo Piano in 1998, Norman Foster in 1999, Rem Koolhaas in 2000 and Herzog and de Meuron in 2001, rewarding big-budget projects, postmodern or close to postmodern, detached from a sense of social role in architecture advocated by New Urbanism.

However, despite the novel ideas of the Chater, it would be rapidly substituted by other theories for the sustainable city, including the Compact City proposed by Richard Rogers. Design solutions differed from those promoted by New Urbanism, testifying here a proficuous and creative moment for both urbanism and sustainability. Nevertheless the goals guiding architecture and urbanism were opposite.

Postmodernism may have created barriers for sustainability, given its underlying concept of nature emphasizing how scientific knowledge construes – rather than researches – nature, and shapes it according to power structures (Foucault, 1966; Derrida, 1967). Despite its theoretical interest, this conception remains self-defeating for sustainable transitions, leaving much room for anti-scientism. Donald Trump's 2012 tweet claiming 'global warming was created by and for the Chinese in order to make U.S. manufacturing non-competitive' is very postmodern, suggesting that sustainability science is

producing the concept of global warming to advance an ideological agenda. Meanwhile, political decisions in some countries which were strategic for sustainability milestones are also diverging from sustainability guidelines, as witnessed by abandonment of the Paris and Kyoto Protocols.

But are new paradigms showing a different approach to sustainability?

Here, we confont cultural paradigms with key theoretical basis of the ongoing project SPLACH – Spatial Planning for Change. SPLACH seeks to inform a sustainability transition of Lisbon Metropolitan Area urban planning, considering the importance of spatial policies and the food system. We assess contemporary cultural dynamics and identify how they influence perceptions and goals favorable to a sustainable transition of cities and their territories. Paradigms show opportunities for analysis of concepts in urban planning.

To answer these questions, we propose the following methodology: first, we present a concise literature review from the SPLACH project, from which we identified indicators for sustainability, to guide the overview of current cultural paradigms. Secondly, we analyze four paradigms through indicators of sustainability. Third, we present three case-studies that display cultural concepts discussed in the previous section. Finally, we provide a discussion and concluding remarks.

2. Literature review

Although the request for a sustainable transition of a metropolitan area has taken the SPLACH project to review the roots of modern urban planning, most of the review focused on studies from the past 20 years, when the sustainability agenda promoted by the Brundtland Report (UN, 1987) gained relevance. Many works are calling for culture to be accounted for. This paper aims to contribute to such account, highlighting studies we find central for a sustainable transition of urban design, spatial planning and the food system.

Steel (2008) analyzes how aesthetical attitudes towards nature were determined by cultural conceptions over human transformation of landscape (agriculture) and food-provision, discussing how such conceptions shaped and organized premodern and even modern cities and suggesting novel relations between aesthetics, land-use and urban design. Gandy (2005, 2011, 2014) has also studied specific relations between aesthetic and cultural sensibilities and infrastructure, exposing how those are inherently linked with relations between individuals, their bodies and nature, including cleanliness, hygiene, health and morality. Marshall (2016) has called for urban design to be acknowledged as art, and established a comprehensive review of aesthetic philosophy applied to urban form. Marat-Mendes et al (2015) developed visual characterizations of infrastructure and land-use in early 20th century Lisbon region, disclosing its utility to inform a metabolic historical perspective of the territory.

Less concerned for aesthetics, the socio-ecological approach to urban metabolism as proposed by the Vienna School implies a historiography of socio-metabolic profiles and regimes (Fischer-Kowalski, 1998; Fischer-Kowalski and Hütter, 1999), focusing on material and energy flows exchanged between the environment and societies.

A different approach is taken by Geels (2002) who, using a Multi-Level Perspective (MLP) on systems innovation, distinguishes three (ideal type) levels composing a system. The first, ‘niches’ include minor and fringe interests, where radical innovation begins; ‘regimes’ on the upper level, include the ‘rule set or grammar’ of the dominant institutions and artifacts; and finally ‘landscape’ testifies the external structure or context for the lower levels. According to Geels (2002), socio-technical regimes evolve overtime by absorbing innovations from niches, and these slowly alter the landscape. The MLP

emphasizes the important and widening contribution of radical ideas towards change that impacts sustainability.

Viljoen et al (2015) have taken grassroots practices of urban agriculture and guerrilla gardening increasingly relevant in Global North cities, and reimagined the city as a 'continuous productive urban landscape'. Agriculture is redefined as a new urban ideal, ultimately disrupting the urban-rural schism which dominated the (cultural and physical) landscape of the 20th century (Kropotkin, 1898; Howard, 1902; Weaver, 1983). Indeed, previously overlooked authors and territory conceptions are being rediscovered for their important ideas in achieving sustainable cities (Wheeler, 2002; Welter, 2002; Batty and Marshall, 2009; Marat-Mendes and Oliveira, 2013; Banai, 2013; Fischer-Kowalski and Weisz, 2016).

From many research areas, including architecture, urban morphology, industrial ecology and planning, studies on the sustainability of cities are effectively exploring the first official definition provided by the Brundtland Report (UN, 1987), which clearly states that sustainability is a social as well as an environmental problem, which should not be forgotten.

In this literature, we gathered three indicators for sustainability we believe account for a cultural shift away from postmodernism. First, is the problem of history and time, since not only sustainability implies conceptualizing links between past, present and future for societies and the planet (Fischer-Kowalski and Weisz, 2016; Gandy, 2018), but recent studies of environmental history (Niza et al, 2015; Marat-Mendes et al, 2015; Krausmann et al, 2016; Winiwarter et al, 2016) also show how transformation of nature in the past may influence the future. Technology and the production system are also fundamental for assessing sustainability, since it goes to the heart of how we transform and explore nature (Meadows et al, 2004; Fischer-Kowalski, 1998; Fischer-Kowalski and Hütter, 1999; Gandy, 2014; Faraud, 2017; Sagan, 2019). Finally, visual culture and aesthetics are an increasingly important for the renovation of urban morphology and design and their relation to the environment (Gandy, 2011; Marat-Mendes et al, 2015; Marshall, 2016).

Much about sustainability depends on rigorous scientific inquiry – but is nonetheless encapsulated in cultural patterns. As such, sustainability concerns can be found outside scholarly circles and extend to art and aesthetics, generalist literature and public initiatives.

The August 2017 issue of magazine 'Marie Claire' focused on sustainability, acknowledging it as a dimension that must be incorporated into the fashion industry. In cinema, the last decade has seen a reemergence of science-fiction, with films like 'Another Earth' (2011), 'Interstellar' (2014), 'Annihilation' (2018), but also such documentaries as 'También la lluvia' (2010), in which themes of natural resource depletion and disaster directly resonate warnings of sustainability science.

The role of food in contemporary life and cities is very notorious and gaining tremendous interest, from highly popular cooking contests like 'Chopped' and 'Masterchef', to entire TV networks like 'Food Network' and countless YouTube channels dedicated to the same theme, from recepy repositores like 'Tasty' to food tourism channels. The film 'Upstream color' (2013) by Shane Carruth draws a wild-love story from a brilliantly intricate scheme to which the nearly-complete food system is instrumental. The book and film series about psychiatrist/ cannibal Hannibal Lecter was revamped in 2013-2015 in a NBC series which displays detailed (and highly meaningful) accounts of food-preparation. Julia Ducournau's film 'Raw' (2016) focuses on the radically shifting eating habits of a vegetarian girl turned cannibal. 'Butcher's Block' (2017), the third season of Scy-Fy horror series 'Channel Zero' also centred on the story of an once-prosperous meat factory which covered-up for a cannibal family.

Relations between societies with nature, and the specific social role that food plays in them have are widely studied in social and natural sciences (for instance, Darwin, 1871; Frazer, 1910 and 1911; Lévi-

Strauss, 1962 and 1964; Douglas, 1966; Odum, 1975; Alier, 1977; Fischer-Kowalski, 1998; Fischer-Kowalski and Hütter, 1999; Descola, 2001) not to mention Turnbull's (1972) powerful ethnography with the Iks of North Uganda, a people devastated by hunger. Hunger has great symbolic charge in the most recent novels by Portuguese writers Lídia Jorge (2018) and Hélia Correia (2018), both of which project a future marked by depletion and deprivation, again resonating with sustainability science. Recent information discussed in the press (Público, March 10th) accounts that 35% of the Portuguese population is deprived of foodstaples such as meat or fish for finantial reasons. Yet, dietary changes dietary have an important impact in urban socio-metabolism, since the environmental footprint of industrial livestock and food regimes themselves are a pressing cultural and environmental problem.

In this paper, we submit that a transition to sustainability is (also) a matter of culture, and that without a public culture of sustainable behavior, this transition will be much slower and less effective. As such, we seek to read how recent cultural theorists have been sensible to the problems of environmental risk and sustainability. We furthermore seek to highlight, among four specific cultural paradigms, what aspects can be either instrumental or detrimental to a sustainable change. Particularly, when applied to urban design and planning.

3. Contemporary cultural paradigms

In this section, we analyze four proposed cultural paradigms, ranging from 2004 to 2011. Our review does not pertain to be exhaustive, but rather to identify indicators for sustainability. These are aspects we believe can be useful to conceptualize sustainable development, including urban design that is self-conscious and honestly engaged with its own time.

3.1. Hypermodernism – the cult of excess

The proposition of hypermodernism is explained by Gilles Lipovetsky in 2004 to characterize a cultural shift towards endemic and excessive consummerism.

Hypermodernism is a modernity at the *n*th power, less of a new cultural era than the continuation and further development of modernity, now structured around the market, technocratic efficiency and individualism (Lipovetsky, 2004). It is essentially a consummate modernity, of everything hyper, a culture of excess and of 'here and now', impacting basic human needs such as food, procreation, death, the body, communications and urban agglomerations (Lipovetsky, 2004).

Aligned with the 20th century, hypermodernism has a tireless enthusiasm with change and novelty while also being deprived of any confidence in the future or in any grand historical vision (Lipovestky, 2004). However, central beliefs in democracy, human rights and the market are reemerging as stable basic political principles, although without credible opposing models (Lipovetsky, 2004).

With regards to aesthetics, Lipovetsky (2004) identifies a mass-aestheticization of pleasure, sense and 'the moment', which amounts to a sensual counteract to the abstract mindset demanded by the efficiency of hypermodernism.

This ambiguity – that the conquest of efficiency is countered by the ideal of earthly happiness derived from pleasure – extends to sustainability. While public awareness of environmental risk increased, it is undermined by the 'here and now' mindset of hypermodernism. So, while public protest against unsustainable industrial practices rises, public action does not, and the rules of the market take the lead (Lipovetsky, 2004).

Hypermodernism is certainly an enlightning tool to analyze contemporary trends in urbanization. First, by exploring the spatial expansion of capitalism to the entire world, hypermodernism clearly sees society responding not only to a postmodernist mind-set where traditional grand narratives collapse, but primarily to the increased liberty obtained by international markets. Many recurrent outcomes of the neoliberalization of metropolitan areas could be explained by the dynamics described by Lipovetsky to understand the current culture. Such is the case of the increased role tourism and heritage in recent urban development: Lipovetsky's (2004) claims for the 'revisionary memory', 'remobilization of traditional beliefs' and 'hybridization of past and modernity' speak directly to the hypermodern vision of history. These also resonate with discourses around the value of heritage in preserving local identity, often associated with the management of the city's market value (Scoffham, 1994; Hodkinson, 2013; Mayer, 2013).

3.2. Digimodernism – freedom and futility

Digimodernism or 'digital modernity' is the second term proposed by American philosopher Alan Kirby (2009) to define culture after postmodernism, 'a new form of textuality, characterized by onwardness, haphazardness, evanescence and anonymous, social and multiple authorship' (2009, 1) emerging in the mid-late-1990s and spawned from digital technology, including in commercial films, reality TV, videogames and internet platforms.

Digimodernism is characterized by a loss of authorship in the traditional sense. However, when the reader, the 'textual consummer' (Kirby, 2009) starts to literally create text where none existed, the result is not free-for-all information and liberty, as envisioned by postmodernism, but a lot of free-for-all infantilism and futility (Kirby, 2009). Successful highly digital political campaigns for Donald Trump in the US, Brexit on the UK and Jair Bolsonaro in Brazil hardly disprove Kirby's point.

The relation of digimodernist texts with chronology is defined by Kirby (2009, 64 and 65) as antisequential and ultraconsecutive. If sequentiality is a progression in which a new term spawns from its predecessor, and consecutiveness is a relation in which terms are contiguous in space or time to each other, the particular features of digimodernism become evident, namely its preference for the latter (Kirby, 2009).

Kirby (2009) states that digimodernism is not primarily a visual – but rather textual – culture: although text becomes highly manual (through the use of fingers in digital technologies), it is aimed at digitization *per se*. In general, digimodernist aesthetics are characterized by references from children literature, 'the apparent real', earnestness and endlessness (Kirby, 2009). In his somewhat pessimistic tone, Kirby identifies the aesthetics of videogames and CGI (Computer Generated Images) as the main sources for digimodernist aesthetics.

Regarding sustainability, Kirby (2009) points out problems associated with consummerism. Although his portrait is as hyper as Lipovetsky's, his response is considerably more radical. Seeing consummerism as a force absorbing social idealism and remaking it in its own image (Kirby, 2009, 240), he extends this problem into the destruction of the planet. Thus, environmental risk will not be solved by smart consummerism, but by consumming less.

3.3. Metamodernism – hopes and fears

While in scholarly debates the concept of metamodernism is associated with an essay by Vermeulen and Van Den Akker (2010), the term has a wider reach, to which artists like Luke Turner (2011) have also contributed.

Metamodernism is the terrain of ambiguity or, to use the term of Vermeulen and Van Den Akker (2010), of oscillation 'between a modern enthusiasm and a postmodern irony, between hope and melancholy, between naïveté and knowingness, empathy and apathy, unity and plurality, totality and fragmentation, purity and ambiguity'. Turner (2011) further sees oscillation as 'the natural state of the world'.

According to Vermeulen and Van Den Akker (2017), metamodernism must not be understood as a paradigm, but rather as what Raymond Williams called a 'structure of feeling': an element of culture that circumscribes it without being ascribable to any individual component but rather to a particular experience of time and space.

Van Den Akker (2017, 22) emphasizes historical events like the emergence of a US-dominated truly globalized world and corresponding spatial limit of capitalist expansion, together with 'the completed incorporation of culture by commodity logic' as the two key mutations of the capitalist system and of Western culture that came to define postmodernism. The 2000s would afterwards bring about metamodernism, whose 'present opens onto – in an attempt to bring within its fold – past possibilities and possible futures (defined as being *with* or *among* residual and emergent structures of feeling)' (Van Den Akker, 2017, 22).

Sustainability is claimed by Vermeulen and Van Den Akker (2010) as one of the conditions which contributed to the emergence of metamodernism: 'the need for a decentralized production of alternative energy; a solution to the waste of time, space, and energy caused by (sub)urban sprawls; and a sustainable urban future have demanded a transformation of our material landscape'. More recently (Vermeulen and Van Den Akker, 2017, 14) the wide acceptance of the Anthropocene notion is added as an expression of 'humankind's becoming conscious of its destructive behavior'.

This extends into aesthetics, as metamodernism is inherently neoromantic, in art's renewed interest in 'the unsuccessful negotiation between culture and nature' (Vermeulen and Van Den Akker, 2010, 7), adding to the shift to 'greenprints' in urban planning.

3.4. Trasmodernism – pastures greener

The synthesis advanced by Tibbs (2011) on sustainability is extremely relevant to understand the implications of sustainability in culture – as industrial growth is approaching systemic limits and eminent collapse, sustainability is seen as a call for transforming society towards sustained development. These problems have been noted since the 'Limits to Growth' study (Meadows et al, 1972, 2004), but significant technological and behavioral changes are more recent (Tibbs, 2011). It is the outcome of such changes that Tibbs sees as transmodernity, projecting it into the future, the present being rather the dawn of transmodernity (Tibbs, 2011, 27).

Technology plays a fundamental role in transmodernity: green-technology counters conventional industrial growth which due to its scale within the biosphere translates into accelerating resource consumption, ecological pittfalls and pollution. Among Tibbs' (2011, 15) suggestions are closed-loop manufacture systems, recycling, ambient energy systems, regenerative agriculture, ecosystem preservation, minimal-impact infrastructure and elimination of emissions, waste, dissipative substances unfit for biological systems.

While expansion was a major program of modernity, industrial globalisation is its threshold. Thus, 'modernity is reaching limits because of its own success' (Tibbs, 2011, 17). Initially, modernity went from poverty to economic security, but this produced another change from security to significance.

It is the growth of post-materialist values that creates social conditions for conscious voluntary change towards a sustainable socio-technical system (Tibbs, 2011).

This proposition of transmodernism is informed by statistical studies on cultural values and by Fritjof Capra's theory of value change, but the dynamics described by Tibbs could also be enlightned by Geels' (2002) use of the MLP: the 'niche' level in the MLP accounts for radical ideas, resonating with the notion of 'cultural creatives' which Tibbs draws from Paul Ray. It is the growth of radical or creative ideas that eventually changes central aspects of culture – or the 'regime' level. Thus, Tibbs' proposition of transmodernity would perhaps be the effective change of the 'landscape' level into a sustainable socio-technical system.

The connection between Cultural Creatives and actual creativity is unfortunately unexplored by Tibbs, since his analysis mostly relies on statistics and systems theory. Nevertheless, he concludes that a general consciousness of the impact of social activities in ecosystems invites for consideration of the aesthetic and artistic expression of new attitudes towards nature.

4. Case-studies

In this section, we analyze three case-studies related to urban design and architecture, seeking to understand how some of the concepts identified in the contemporary cultural paradigms section may be spatialized. The case-studies are related to issues of the food system, as we argued as this is central for sustainability transitions (Steel, 2008).

4.1. 'Modern Masterpieces Revisited' by Luís Santiago Baptista

Fig. 1 - Luis Santiago Baptista - Modern Masterpieces Revisited #5 (2016)

In the exhibition 'Modern Masterpieces Revisited', architect Luís Santiago Baptista (2016) presents a series of photomontages and short texts that transform and reenvision modern

buildings from Adolf Loos' 1910 Steiner House to Aldo Rossi's 1980 Teatro del Mondo. One of the photomontages (Figure 1) shows Le Corbusier's Ville Savoye (1928-1931). The former white façade is now covered with red industrial metal, the exterior, a former green-field has now a farm with agricultural plots and a tractor (Baptista, 2016, 45). The author argues that Le Corbusier produced, among other things, 'living machines' for the industrial bourgeoisie as a peripheral escape from city life, a dream that was 'only sporadically inhabited' (Baptista, 2016, 44).

Baptista's photomontage can be understood through Heiser's (2017) metamodern analysis of super-hybridity. Although Heiser focuses on promotional imagery for ISIS (Islamic State of Iraq and Syria), the term describes 'creating by way of existing sources [which is not] automatically merely unoriginal pastiche' (Heiser, 2017, 56). The simultaneity of clashing elements is what produces this sort of metamodern super-hybdridity. On the other hand, the text interprets this susburban vision as one 'pleasant and pacified relation with domesticated nature' (Baptista, 2016, 44). Yet instead of the green lawn of typical photographs of the Ville Savoye, we see 'domesticated nature' through an agricultural field, an idea that can be seen as a neoromantic or even pastoral but that can also be associated with the increasing awareness of the unsustainability issues (Tibbs, 2011; Lo, 2016) and with a metamodern neoromanticism, as explored by Vermeulen and Van Den Akker (2010).

Urban agriculture is gaining public attention for its impacts on the food system, metabolism, and social benefits (Cabannes and Raposo, 2013; Dias, 2018; Delgado, 2018; Marat-Mendes et al, 2018). Moreover, Guerilla Gardening is gaining momentum as grassroots initiatives to appropriate vacant land (Lyons et al, 2015; Reynolds, 2016). In France, where the actual Ville Savoye is located, urban agriculture is a relevant phenomenon, and rural communities of France have been noted for their sustainable practices (Berger, 1979). Thus, when Baptista transforms a modern urban vision into a more 'natural' suburb, he is transporting it an idealized past, and inevitably projecting it into an idealized (and more sustainable) future.

4.2. Vale de Chelas Horticultural Park

Fig. 2 - Chelas Valley Horticultural Park and 'Five Fingers' estate from the Lóios Neighbourhood.

Fig. 3 - Chelas Valley Horticultural Park seen from a deck of the 'Five Fingers' estate. In the background, the Flamenga Estate.

In 2010, the Lisbon Council opened the Chelas Valley Horticultural Park, predating the most recent Lisbon Masterplan (PDM – *Plano Director Municipal*). Recently, the neighbourhood had undergone refurbishings and demolitions, to tackle criminality and social exclusion.

Four years earlier, the Lisbon municipality had revived the 'Green Plan for Lisbon', prepared in the 1990s by landscape architect Gonçalo Ribeiro Telles, integrating it into the Municipal Masterplan (Morais, 2006). This process placed hope on a Masterplan that promoted sustainability, since the Green Plan envisioned an extensive, varied and productive ecological structure. However, in 2010, the radical *non-aedificandi* status the 'Green Plan' suggested for green-fields, including courtyards, was refused by the Council (Henriques and Sobral, 2010; PDML, 2012).

Currently the Horticultural Park is thriving, but occupies only a part of available land in the area. The same land was completely used for agriculture, before the construction of several high-rise buildings, from the 1960s to the 1990s. Collective blocks and streets-in-the-sky (Figs. 3 and 4) make many of Chelas' estates important examples of Portuguese architecture and planning opening to international debates (Borges, 2017; Borges and Marat-Mendes, forthcoming), but the agrarian past has not disappeared. As such, further urbanization may be at odds with the desires of the population.

Fig. 4 – Guerrilla Garden in the Chelas Valley. In the background, the Alfinetes Estate.

In the vacant land nearby the Chelas Monastery lies an extension of illegal gardens (Fig.4), among beaten earth tracks and semiderilict cottages. Unlike the orthogonal agricultural plots of the Horticultural Park, here plots are irregular, separated by frail clumsy fences. This Guerrilla Garden (Reynolds, 2016), most likely associated with food security rather than leisure or environmental concern, is built by anonymous people who nonetheless partake in the improvement of Lisbon's environment.

Urban agriculture as in the Chelas Valley – municipal and illegal – have great environmental impacts (Viljoen et al, 2015; Faraud, 2017) and a productive urban green structure is instrumental to downsize the impacts of current agrifood business-structure, essential for achieving transmodernism (Tibbs, 2015).

Fig. 5 - Urban situation of the Chelas Valley Horticultural Park

Fig. 6 - Urban situation of the Guerrilla Garden in the Chelas Valley

But the contrast between the high-rise estates, conveying modernism, brutalism and postmodernism, and the persisting agrarian practices (Figs. 5 and 6) suggest interesting relations with metamodernism, not only because farms have an inevitably Romantic imprint in urban landscapes, but their relation with the history of the Chelas Valley also demonstrates a creative use of the past as a tool to bring forward the present (Vermeulen and Van Den Akker, 2010; Heiser, 2017; Toth, 2017).

Significantly, the proponents of metamodernism (Vermeulen and Van Den Akker, 2010, 11) claim that 'In architectural practices […] an emergent metamodern style still needs to distinguish itself from the dominant postmodern discourse'. Widening architectural concepts to (re)integrate urban design would favor a metamodern negotiation between nature and culture (Vermeulen and Van Den Akker, 2010, 7). This would emphasize the relation of urban form with the physical territory and encourage new solutions to critically interpret preexisting ones (Borges and Marat-Mendes, forthcoming).

4.3. Two municipal markets in Lisbon

Municipal markets were strategic in the urban development history of Lisbon (PMM, 2016). In 2016, the Lisbon municipality prepared a 'Plan for Lisbon Municipal Markets' (PMM, 2016) which envisioned a revamping of existing market buildings to revive the roles they once played in neighbourhood life and local commerce, but also to emphasize their qualities as public places, as encouragers of sustainable commerce and tourism (PMM, 2016). The plan is already being implemented and many municipal markets have indeed undergone refurbishing processes. Two of these were refurbished and partially handled to private agentes before the PMM: the Campo de Ourique Market and the Ribeira Market.

Fig. 7 - Eastern façade of the Campo de Ourique

Fig. 8 - Southern entrance of the Campo de Ourique

Fig. 9 - Fish selling area of the Campo de Ourique Market

Fig. 10 - Fruit-vegetable selling area and food court

Campo de Ourique Market was opened in 1934. Designed by António Couto Martins, it had shops in its outer perimeter and an open central space for food-produce stands. A first refurbishing by Daniel Santa Rita, Alberto Oliveira and Rosário Verde happened in the 1980s. The Southern façade was redesigned to become the new main entrance, with tile cylinders and metal grids, bringing a postmodern touch to the Art Deco style of the original design (Fig.8).

The most recent refurbishing was concluded in 2013, before the PMM. Basic features were kept, outer façades maintain retail stores. The inner area includes stands and a food court (Fig.10), with several restaurants sharing space with stands selling fruit and vegetables. Only the fish selling area is separated from the remainder, but there is a fluid conviviality (Parham, 2016) between commercial and consumption spaces.

Fig. 11 - Main façade of the Ribeira Market

Fig. 12 - Entrance of the Ribeira Market

Fig. 13 – Entrance hallway of the Ribeira Market

Fig. 14 – Western wing of the Ribeira Market

The Ribeira Market dates back to 1882 and was transformed in 1903 by João Piloto (Fig.11). Since then, the market is structured by an interior corridor separating two wings – one on the East and one on the West. In 2014, a refurbishing was conceded to 'Time Out' aiming to mix traditional activities of the municipal market with contemporary food commerce. However, the concession negotiated with the municipality conveys more parallelism than mixture, as the two main wings have different functions –a food court on the West wing and a market on the East.

That both markets articulated public and private agents, shows that market interests have become indispensable for public intervention (Lipovetsky, 2004). Particularly in the Ribeira Market, located on the riverfront, activities seem directed at tourism, while in Campo de Ourique greater compromise was achieved between old and new functions.

Most of what is new in the markets is temporary: metal structures, dismantable stands and grandstands, ad-signs and pannels both in cloth and digital. The buildings are protected by the Municipal Masterplan (PDM, 2012) and the PMM (2016), so radical interventions were unlikely. Architecture of the past is preserved in a rather theatrical way, while new elements are frail and removable. This echoes Kirby's (2009) critique of digimodern earnestness, in which a present phenomena is set in the past but establishes no dialogue with its mores.

Kirby's critique that CGI films, relying on visual effects, do not seek any 'critical engagement with the world' (2009, 182) could also explain what is particular to the entrance hallways of the Ribeira Market (Figs.13, 15 and 16). The digital pannels, shifting every few seconds, keep providing information on Lisbon's cultural agenda and events promoted by 'Time Out'. The world seems like

an endless circuit of leisure activities and less attention is given to what happens in the Eastern wing. The importance of markets for other aspects of urban life – including food security – is absent from this endless succession of events, mostly catering to youths, tourists and the affluent middle-class.

The suggestion of endlessness is where hypermodernist and digimodernist concepts meet, in these two markets. Removable stands point out that renewed life may not last long. Indeed, much of the current success of these markets depends on the flux of tourists and visitors. But if this flux diminished, would they continue to thrive? This problem goes to the heart of the PMM (2016) and its goal of reviving the role of markets in neighbourhood life.

Figs. 15 and 16 - Digital pannels of the Ribeira Market entrance

5. Discussion

Analyzed paradigms include many concepts and concerns which strongly favor a sustainability agenda. In general, the four paradigms could be grouped into two groups: hypermodernism and digimodernism are somewhat negative assessments of the contemporary age, while metamodernism and transmodernism are cautious but optimistic and hopeful.

Having this in mind, with respect to history and time, both Lipovetsky (2004) and Kirby (2009) emphasize presentism and haphazardness emerging from economic and technical conditions. An obstacle to implementing a sustainability agenda is that it necessarily privileges our relation with the future. Yet how can the future 'in deep time' of bio-systems (Krausmann et al, 2016; Gandy, 2018) be widely understood by a society increasingly organized around individualized exprience of time (Lipovetsky, 2004; Kirby, 2009).

This has further implications in Lipovetsky's (2004) discussion on the withering of public power and growing deregulation of the market, which urban design illustrates well. Figueira (2016, 17) exposes how market liberalization and regulatory spatial planning pushed architects to focus only with what they could control – buildings. Nevertheless, urban interventions considering the future of buildings, as witnessed in the examples of two Lisbon municipal markets, are not prioritary, as most interventions focus on the needs of the 'here and now'. Meanwhile, spectacular design has been widely sought by the State, municipalities, the private sector and architects themselves even at a time when Kirby (2009) senses the death of the spectacle society.

Research at SPLACH (Marat-Mendes et al, 2018) confirmed that spatial planning in the Lisbon Metropolitan Area is dominated by land-use *management* policies. With the State downsizing its role in housing and public equipment, architecture becomes a commodity dominated by private-market

investment and big-budget demand, overriding beliefs in any strong social role (Borges, 2017; Marat-Mendes and d'Almeida, 2018; Borges and Marat-Mendes, forthcoming).

Yet, the neoromantic approach to nature (Vermeulen and Van Den Akker, 2010), as well as the 'plastic' vision of the past (Toth, 2017) of metamodernism point towards more personal and affective notions of history and time. This reading is confirmed by Tibbs (2011) who associates ecological concerns with a shift from materialist to post-materialist values.

With visual culture, we find another overlap between hypermodernism and digimodernism, emphasizing evanescent and massified aesthetic sensibilities (Lipovetsky, 2004; Kirby, 2009). However, metamodernism arises from the arts as a reorganization of both modern and postmodern aesthetic sensibilities, towards the particular experience of the present.

Vermeulen and Van Den Akker (2010) claim no metamodernist architectural style has emerged yet from the trends of the past decades. In Chelas, the Horticultural Park reframes the urban landscape, creating a productive void at the heart of a renewing neighbourhood trying to overcome problems of social exclusion. And Baptista's (2006) interpretation of the affluent suburb turns modernist machines into agrarian plots. The role of food production in landscapes and social activities (Steel, 2008) is meaningful here, because it constitutes one of the ways in which human beings are intrinsecally entangled with nature. This entanglement, we suggest, will be central for defining a metamodernist architectural and urban style.

The theory of de-growth (Meadows et al, 2004), acknowledged by Tibbs (2011), may find strenghtening in hypermodernism and digimodernism. The fast-flows of digital information that have been absorbed by nearly all levels of communication (Kirby, 2009) – from personal to institutional – are concomitant with hyperconsummerism (Lipovetsky, 2004). Only in 2018, the global e-retail sales volume was 2,8 trillion US dollars (Statista, 2019), and the capital weight of online commerce is expected to continue to grow.

Gandy's (2014) suggestion that infrastructure determines social and individual attitudes towards body and nature may well apply to the food system. Several infrastructures used in the various phases of the food system – land in production, roads and railways in distribution, buildings and urban elements in commerce and consumption, and waste-management facilities in disposal – although most are not exclusive to it. This scheme of infrastructure-use for our current food system was shaped by the agrifood industry and results in specific attitudes towards the body and its relation to nature. This is an important theme in metamodernism and transmodernism.

New attitudes suggested by these paradigms are fundamental for reassessing the infrastructural support of food provision. Awareness of the environmental harms of meat consumption and industrial livestock, as well as concerns for animal welfare, co-exist with an anxiety over cannibalism in art. North-American writer and metamodernist precursor David Foster Wallace (2004) wrote an essay on the Maine Lobster Festival, including disturbingly detailed accounts of lobster preparation, questioning the ethical implications of our eating habits.

Setting aside discussions of food regimes, the ethical and moral problems associated with food habits is an important part of contemporary culture, and may be instrumental for transmodernism, call into question the haphazardness of digimodernism, oppose hypermodern market deregulation (Spaargaren et al, 2012) and hyperconsummerism, and favour of post-materialism, meaningful relations with nature and sustainability. Cultural values and attitudes are fundamental to bring about such change.

6. Conclusions

History is fundamental to conceptualize culture, as verified both in the selected paradigm proposals and the SPLACH literature review. Contemporary creative approaches to history widen the horizon of possibilities. This applies to environmental history, which discloses socio-metabolic transitions throughout time, encompassing the food system in its several dimensions (social, spatial, environmental).

With the globalization of capitalism, time and speed of events take precedence over space. This is visible in the lack of durable solutions for territorial transformation. Spatial plans are not meant to remain active for long periods and are influenced by legislative calendars. Moreover, it seems prioritary to keep urban land – especially vacant – available for the evershifting needs of the market, wich would be impossible under long-term strategic spatial planning. This overrides the tremendous importance of green spaces for urban structure and its historical transformation (Whitehand, 2019).

This ambiguity about contemporary space can only be understood by acknowledging the territory for its physical characteristics, but also the cultural meaning it conveys. Hypermodernism, digimodernism, metamodernism and transmodernism are four examples of contemporary cultural paradigms, whose descriptions of a particular experience of time and space allow urban design for creative possibilities on territories. Thus, conditions are favourable for sustainability, yet it should be understood as a broad concept encapsulating both natural and socio-cultural challenges.

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Offline digital – digital offline
The potential of offline digitised information for the production, distribution and appropriation of human knowledge

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Introduction

The digital revolution brought about enormous shifts, one of them in the way scientific, technical and other information is produced and disseminated. Vast amounts of such digitised information has been produced, reproduced and distributed mostly via the internet. Considerable parts of the wide range of analogue information existing before the advent of the information technologies have also been converted into digital format.

In this paper we follow Heinz von Foerster for the definition of information and knowledge. Knowledge requires a human brain, therefore it cannot be stored in media, only information can (Foerster, 2008).

Digital refers to data and information stored electronically in media usually in binary codes, digitised refers to data and information produced in or transformed into binary code, digitalised refers to models of business that leverage digitised information for business processes. In computer technology and telecommunications, online indicates a state of connectivity, and offline indicates a disconnected state.

The wealth of digitised information is however only available to users that have access to an internet connection

– these are only about half of the world's population[33].

International attention and efforts are concentrating on expanding internet services. Although there has been remarkable progress in coverage, for instance, in Sub-Saharan Africa from just 2.1% in 2005, to over 22% of individuals in 2017, an overwhelming majority of the population live without or with only weak connectivity to the net.

Their needs for information are mostly ignored, as the world's attention is concentrated on the internet. The expansion of connectivity through the net, however, requires heavy investments in infrastructure, adequate public policies and much more. The running costs, both financial and ecological, are also quite considerable with prohibitive costs for users, which further prevents expansion.

On the other hand, new technologies such as smartphones and portable memories, with high capacity for data storage are spreading much faster than the internet. This raises the question of whether technical and scientific information can be disseminated in an offline format.

In this paper we first analyze, from a historical perspective, how changes in media affected the production and transmission of knowledge and the present and future implications of the recent availability of digitised information for knowledge production. Secondly we will try to understand to what extent offline digital information can help to overcome digital inequalities and how the wealth of

[33] International Telecommunication Union, World Telecommunication/ICT Development Report and database.

information already existing in digitised format can be made available for offline users in order to contribute in a meaningful way to improve human knowledge.

Knowledge institutionalised

The digital revolution is not the first radical change in the way human societies produce, handle and apply knowledge. The Neolithic revolution which began about ten millennia ago, already brought about ground- breaking transformations – the Agrarian societies provided a fertile ground for the acquisition and transmission of information. The knowledge of hunters and gatherers was transformed slowly. New knowledge was won and tested over a long time-span, before it was stored and transmitted in myths[34], rituals and social structures.

Initiation rituals provided one of many opportunity of knowledge transmission – including the secret dimensions that were considered essential for the internal cohesion of societies organised along the ethnic matrix. (Sigrist, 1994), (Schiefer, 2002). The confined transmission lines with a grading of access to the most secret parts show that societies recognised very early the importance of knowledge. The distinction between holy and profane that is basic for ancient societies also found its expression in the division of knowledge (Eliade, 1968).

The advent of a new type of knowledge that surpassed the narrow confines of ethnic tradition and was based on logic and reasoning rather than on myth and story-telling found its expression also in new ways of transmission (Sloterdijk, 2011). The axial age provided in China, India, Persia, Judea, and Greece in the first millennium BCE new ways of thinking that, at least in part, found their institutional expression in new centres of learning (Jaspers & Jaspers, 2017). Plato's academy lasted, with some interruptions, nearly a thousand years. The influence of Aristotle, his most famous student, who structured and wrote a complete syllabus, lasted even longer and had a more profound impact on the university model. In Europe it seems to have been the first successful institution to take the tuition out of the confines of the family environment by creating an open space for instruction. Chinese institutions of higher learning are as old and have trained imperial elites for millennia (Needham, 1956a) (Needham, 1956b). They produced phenomena such as the imperial examination systems that were later adapted by elites in Western Europe and still exercise a strong influence on modern societies. A comparison of the Greek and Chinese syllabus, fundamental differences in their episteme (Foucault, 1994) notwithstanding, (Jullien, 2002), (Jullien, 2004) shows uncanny similarities (Wilhelm, 2012) (Needham, 1956a). The Greek division of disciplines survived in the trivium and quadrivium of the middle ages until modern times in Europe.

Academic institutions for the training of elites go back at least two and half millennia. They produced a model of an institution that is at least partially closed and distinct from its environment, usually in competition with rival institutions. As a general rule an academy has proper infrastructures, a specialised teaching staff, paying students, age grading, a combination of collective and individual learning, a distinct syllabus, exams and certification, and written forms of information storage[35]. In most cases it also has an international dimension, be it through its teaching staff, student body or the origin

[34] For an interesting interpretation of the Gilgamesh epos, the oldest known myth representing the original conflict between hunter and agriculturalist, from an economist's perspective see: (Sedlacek & Havel, 2011).

[35] For a short history of ancient libraries as precursors of modern online and offline libraries see the study about "Radical Tactics of the Offline Library" (Warwick, 2014). Warwick's seminal and critical analysis gives an overview from a historical perspective over a wide range of problems touching the offline-online topics of modern libraries.

of its teaching material. As in the pre-Neolithic and Neolithic ages, the transmission of accumulated knowledge always used to be imbued with the transmission of values and social norms[36].

In a global perspective, the modern university as an institution of higher education seems to be the most successful model for providing scientific training for elites, although there have always been other institutions, such as religious orders, military academies, and specialised institutions for public administration, to name just a few types. The rapid expansion of universities, from about 600 in 1945 to more than 10 000 at present is due to the growing need of rapidly industrialising societies to produce technical-functional elites to manage their economies and societies.

European universities have trained national and colonial elites for five centuries, modern European research universities that integrated research and teaching within an autonomous space free of political state intervention, were conceived about two centuries ago (Humboldt, 1999), (Newman & Turner, 1996).

Their transformation into industrial-type, digitalised, scalable knowledge factories in Eurasia spans two decades. The "Bologna process" created a common space for Higher Education, with supposedly standardised levels of qualification and mutual recognition of diplomas between 48 countries. Basic tenets of this transformation are the economisation of education (Krautz, 2014), with stress on cost reduction and quality improvement through industrial quality management and certification processes (Münch, 2009). The standardisation and certification of mass-produced technical-functional elites answers a need for globalising labour market where industrialisation requires highly qualified[37], exchangeable employees or "free subcontractors" (Liessmann, 2014).

The medium is the medium

Profound changes in the socialisation of human knowledge coincided essentially with the revolutions in the transmission media. The Platonic academy passed from oral, rhapsodic transmission of myths to (hand) written texts and drawings. Manuscripts always played an important role, and still do. They were, however, superseded in quality and quantity by printed matter, first invented in China, and later, independently, in Europe. The invention of the printing press with movable types (Gutenberg) provided texts, printed pictures and graphs which were much more accessible due to new distribution systems. With these new delivery systems, such as print shops, bookshops, university and public libraries and similar institutions, information on printed matter broke out of the narrow confines of religious orders and the courts of the nobility.

Printed texts, such as books and journals, as well as digitised electronic media have influenced how societies through their human brains – the primary social organs (Hüther, 2010) - produce, distribute, receive and appropriate information.

The new form of knowledge and its transmission combined the teaching by specialists with the written code as exemplified by the alphabet or standardised ideograms. It also produced a new style of knowledge acquisition as exemplified by the Greek askesis and the Confucian discipline in the east.

[36] The ancient ideal of kalokagathía survived in several transmigrations in the education systems of Europe until the 20th century. So did the universal human values developed by the original cosmopolites. Cf.: (Sloterdijk, 2011).

[37] For a profound critique of the level of qualification produced by the Bologna process see: (Liessmann, 2014) who continues the critique of Adorno on modern higher education (Adorno, 2006).

Handwritten as well as printed information can only be used after an intensive training. It takes at least five years of preparation to read a simple text, and 12 to 15 years to be able to read scientific texts.

Writing, however, enabled the information to become portable. Where before either the teacher had to travel to his students – a well-documented fact in Greece as well as in China – or the more common phenomenon that the students travelled to their teachers, now accumulating information could be stored and pass through time and space.

With the advent of the 20th century new technologies allowed the recording of still as well as of moving images. This and the recording, storage and distribution of sounds changed the whole game, because the consumption of these new media does not require previous training. The analogue or digital recording and transmission of sounds became available to illiterate or semiliterate people, be in in the form of radio, telephone or of cassettes being sent by mail. The same applies to pictures and films.

This does not, however, dispense with the necessity for a basic "technological alphabetisation" to improve the capacities for the adequate use of the new technologies. In practice the operational knowledge, based on the "social life of information" (Brown & Duguid, 2000) for the use of modern devices such as smart phones spreads by ways of peer-to-peer learning processes, which are informal but very effective[38].

The fruitful use of information – production, consumption, interpretation and processing – in short, the transformation of information into knowledge, naturally requires the capacity to relate it to a mental reference grid.

The internet trap

Modern scientists' fascination with the internet – where money, investments, business models, communication, political control, as well as their lifeworlds (Held & Husserl, 1986) converge - has largely obscured the potential of offline digitised information for the storage and circulation of information and the appropriation of knowledge. This mirrors only a small slice of the real-life forces that shape the internet – it is certainly not the use by scholars that powers the dynamics of the digital world, although at times their inward-looking approach seems to induce into this make-believe.

For the connected user the production, digitisation, storage, distribution and consumption of information seem intricately woven into the phenomenon internet (Palmer, 2005). It was certainly the rapid digitisation of information (often under misnomer "human knowledge") that fired the expansion of the internet, based on digitalised business models. Although the technological base was originally military, it was the commodification for the mass market that provided the economic incentives to mass produce ever cheaper components. This created the dynamics that have now reached a tipping point for generalised access. Although the first systematic use of the internet was by and for scientists, scientific information nowadays is only a small part of information circulating. It is however absolutely crucial for modern science as well as for the functioning of industrialised and industrialising societies. It also plays an essential role for higher education in all fields.

The cheap access and international networking capabilities created and boosted the production, systematisation, and dissemination of scientific information, on a plethora of dedicated platforms. It

[38] For instance, the practical knowledge to use mobile phones to effect and receive payments in the MPESA systems spread easily through the population of Kenya.

was a precondition for the rise of original phenomena such as the Wikipedia[39]. The Wikipedia in fact profoundly changed the way in which information is produced, validated, circulated and consumed. Where before valid information was restricted to specialised institutions and a qualified elite, the Wikipedia was open for everybody interested in sharing knowledge. The validation is effectuated through strict internal quality control mechanisms, although critical voices about its level abound (Lanier, 2018). The "Creative Commons" approach solved some of the problems stemming from copyright and intellectual property questions (Warwick, 2014). Numerous wiki-platforms expand greatly the area of production and consumption of more specialised information.

Bridging the digital divide

The lifeworlds of large parts of the human population have undergone profound and wide-reaching transformations by expansion of the internet. Yet great parts of the world are still offline or have only occasional and weak access to the net. This has been analyzed as digital inequality (Robinson et al., 2015). In 2018, roughly more than half of the world population had internet access. In Sub-Saharan Africa, the data available indicate that the percentage of population using internet in 2017 is around 22%[40] although there are considerable differences among countries: In Cabo Verde for instance the percentage of users reaches almost 60% and in Guinea-Bissau, another lusophone country, the percentage is estimated at less than 4%[41]. Furthermore, internet access for many users may still not really be functional.

A series of technological developments are now changing the conditions for access to scientific (and other) information for people without internet access. Smartphones, tablets and computers are becoming cheaper, so that many people in dire economic conditions gain access to them[42]. Ever cheaper (off-grid solar) electricity technology provides the energy to power these devices for poorer populations outside urban centres and industrialised regions. The expansion of access to digitised information originally provided for and through the internet through a convergence and increasing interoperability (Suleman, 2010) produce the conditions for a revolution in horizontal and vertical transmission (Warwick, 2014).

The dynamics produced by the advances in the digitisation are significant and manifold: physical requirements are reduced – a whole library fits into a pocket and a whole university syllabus fits onto a smart phone. This is important for regions of the world where logistic chains for books and other printed matter are weak or non- existent. Books require adequate storage space and certain physical conditions, not always easily found in tropical climes and precarious living conditions. Electric light for reading is taken for granted by most people, but still far from universal. Digital information is much cheaper to acquire; logistic chains through which books or journals are produced, shipped, delivered and stored are as unnecessary as are libraries in zones without the necessary concentration of demand. The reproduction of a book requires both a publisher and a printing shop; a photocopier will do for smaller volumes. This infrastructure is not available everywhere, fairly expensive and difficult to maintain. On

[39] The Wikipedia has by now produced a growing family of specialised wikis for different kind of users: for kids, for students, for health personnel, etc.

[40] World Bank Data based on data from the International Telecommunication Union, World Telecommunication/ICT Development Report and database. Although the quality of this type of data maybe doubtful, they can give us a rough indication.

[41] See: https://www.internetworldstats.com/stats.htm

[42] There are numerous movements to produce dedicated hardware at minimum cost: the Raspberri Pi series of card-sized specifically developed computers to aid education may serve as one of many examples.

the other hand digitised information is easy to copy without cost. This naturally raises questions about intellectual property and copyrights. The problems posed by these questions can, however, be overcome by educational institutions. The tendency of "freeing" information as propagated by the Open Access movement and practised by others, such as Google Books, and a plethora of other movements, will probably gain more and more influence.

The actual access to information is also vastly different – the electronic search function and the offline Wikipedia may serve as examples.

This suggests a rethinking of the "digital divide" which is no longer synonymous with internet access. Is there still a divide or rather a frontier zone where different forms of access overlap?

From the Babylonian Confusion to the descent of the Holy Spirit

Meaningful traditional knowledge has always been confined to the language boundaries of societies[43]. Only with the change of the medium and the codification of information these boundaries have been overcome.

Historically, the training of imperial elites usually implied the acquisition of common ruling languages. The production and access to scientific knowledge required linguistic competence. This was a tiresome and costly process that occupied a good part of their education systems. Imperial elites usually became fluent in at least one or two acquired written languages. For the Han this was Mandarin, for the Hellenes Greek, for the Roman Empire Latin and Greek, for the Europe of the Middle Ages Latin and Greek, for the Internet age up to now, English. Although currently Mandarin is gaining ground, at least in scientific publications, it is too early to say if this will translate into a rivalry with English as the dominant internet language.

The advent of translation software[44] has now reached a level where many functional and scientific texts can be easily and cheaply translated from and into many languages[45]. Even though the final quality of translated texts is not yet perfect, they are getting better and are mostly clear and understandable. These machine translation processes require digitised texts and are internet-bound, their equally digitised results, however, are not.

The Wikipedia[46] is a good example of this: although machine translations of articles are still frowned upon by the editors, they are gaining more and more ground.

[43] This does not imply that societies are monoglot. In rural Africa, for instance, Agrarian Societies are not limited to one language. Many people speak quite a few languages, and for official events specialised interpreters may be called in (Schiefer, 2002).

[44] See for example: https://translate.google.com/ or the newer site that provides much higher quality translations: https://www.deepl.com/en/translator.

[45] A parallel development can be seen in the progress from the original "machine languages" needed to interact with computers, to the software, both operation systems and applications, which are more and more converging to produce user interfaces that transcend cultural and linguistic boundaries.

[46] It is to be expected that smaller versions of the Wikipedia such as the Portuguese edition which currently has a volume of about 14 GB will grow faster than the English version which has a volume of about 78 GB. Translation engines will accelerate the adaptation and exchange across language barriers.

Seek, and ye shall find.

Finding information for all purposes has been revolutionised by the advent of the "search engine". These engines became widely known as features of personal computers, before they enabled and conquered the internet[47]. In earlier times finding information was based on acquired knowledge. In traditional societies, knowledge was stored in people's memories. In a later phase, people were supposed to know their texts, a knowledge that took decades to master and called for expensive and cumbersome systems, such as library catalogues, bibliographies, indices, etc. The advent of online libraries has not reduced complexities. There are now calls for Digital Librarians (Sreenivasulu, 2013) as well as approaches to evaluate their value, use and impact (Hughes, 2012).

Nowadays, search engines are also available offline, for personal computers, tablets and smartphones. They are easy to handle and effective. They greatly facilitate the access to offline digital information. The miniaturisation and cost reduction of storage media that provide de material basis for digital libraries are impressive. They require, however, some expertise in order to be effective, which cannot always be taken for granted, if the knowledge of the average user may serve as an example. Technical advances have greatly facilitated the building and use of offline digital libraries[48]. 15 years ago the building of a digital library was still the domain of informatics experts (I.H. Witten et al., 1999) (Ian H. Witten, 2002).

The extra mile – through walls and through the bush

The potential of offline access to digitised information encompasses a diverse and wide range of situations and opportunities[49]. From confined spaces where internet access is blocked artificially, such as prisons, schools, totalitarian countries and the like, to the vast regions of the planet where internet is either non-existent, not functional or too expensive to be accessible for many[50].

Technology transfer, confluent streams and changing business models

In fact the technical advances in various fields are creating the conditions for new dynamics that will have a profound influence on the lifeworlds of people with no or non-functional internet access.

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[47] Google now dominates 93% of online searches and its parent company Alphabet occupies third place on Forbes ranking list. https://forbes.uol.com.br/listas/2018/05/forbes-divulga-as-marcas-mais-valiosas-do-mundo-em-2018/

[48] On the other hand, in Lusophone African countries there seem to be no offline digital libraries – with the exception of the usual rather limited personal libraries stored on the devices of scholars and intellectuals. The knowledge about offline Wikis does not seem to be very common. At least we have not been able to trace any hints.

[49] Through the KIWIX platform a whole array of Wikipedia products is now available offline. Although this was originally planned for prisons and educational facilities, is has proved to be extremely practical for access in "remote" areas as well as in highly developed regions, because of its easy, cheap and very fast access – anytime, anywhere. (https://www.kiwix.org/en/home/).

[50] Even in countries where mobile payment systems have penetrated most regions, such as for example Kenya, these are based on telephone networks and not on the internet which is still patchy. Kenya's MPESA payment system is a good example for the positive network effect. Once a network reaches a certain density it becomes necessary for most actors to join in.

As an example: in wide regions of Sub-Saharan Africa the confluence of the availability of smartphones, off grid solar panels, digital storage media and the like provide the technical bases for the distribution and use of digitised information.

This technology transfer happens on the simplest level, though, through the marketing and acquisition of end users' objects. With very few exceptions there is no relevant technology transfer of production capacities, such as factories or even repair shops. While highly sophisticated objects proliferate, there is only negligible investment in the countries' overall technological development.

The availability of digitised information as well as the advances of machine translation capabilities and the advances in offline search engines have now reached a tipping point where internet based developments allow to transcend the internet. The more and more intuitive use of smartphones, tablets and personal computers facilitates the access. The generalised use of icons in communication provides an easy alternative to written texts as did the standardisation of interfaces over a wide range of applications. Touch screens already simplify the use of devices which do not require keyboards anymore. The speech functions of smartphones allow even illiterate users to access their devices: e.g. they can simply ask a question and listen to the answers.

Different business models based on the self-organising market-based distribution systems for advanced equipment, centred on end-user devices, are currently penetrating areas until now cut off from modern technology and provide the bases for satisfying the demand of know-how as well as for scientific information. The confluence of these advances results in a new quality.

This raises a series of questions: What are and will be the distribution mechanisms for offline digital information? Are there self-reinforcing loops? Which market mechanisms may grow from the technological dynamics?[51] To what uses can digitised information be put offline? How will the new availability of ever cheaper technology affect knowledge production, circulation and acquisition of information? What will be the effects of offline digital information in spaces where the internet is heavily policed by the state or where the internet companies collect ever more user data?

Will the scientific open access movement[52] that tries to guarantee free (online) access to scientific information financed by public funding include offline access? Will it be able to overcome the massive resistance of interest groups that defend the proprietary models of selling information? Or the business models of companies that dominate the internet?

A profound rethinking of the way education systems handle information seems urgent.

The effects on education systems cannot yet be fully gauged. Many institutions of higher education, especially in areas with weak internet access, are still struggling to understand the implications of the technological revolution that is taking place in their surroundings. Will their business model which is based on conditional access to information (libraries, online access, etc.) hold? How will the more generalised access to digitised information influence research and teaching? Will they be able to open their systems in such a way that they help to spread scientific and other information online and offline to the general public? Can they broaden their recruitment base by facilitating information access to

[51] The new dynamics that will power "the internet of things" is already attracting huge investments and attention. With the growing importance of this new connectivity offline data bases will appear to be technically even more obsolescent.

[52] The scientific open access movement is only one branch of a big tree that includes free operation systems and free software – but most of effort seems to be dedicated to free online distribution and access. For a good summary of Open Access see: https://en.wikipedia.org/wiki/Open_access.

prospective students? Can they change their role in society from elite training institutions to becoming general providers of quality information for a wider public?

Will their proprietary model of information management be able to adapt to an environment where information flows more freely? Under a more generalised open access, can the information management be separated from the teaching and learning (transformation of information into human knowledge) and certification processes?[53]

Will universities and other institutions be able to become true innovators and reach areas that are still offline?

Institutions setting knowledge free

Universities and other institutions of (higher) education could play a significant role in granting online and offline access to information that has been accumulated and transmitted through many generations, not just to their teaching staff and students, but also to a more varied interested public.

Their role can be manifold: they are able to produce, collect, select, structure, translate, transform, validate, legalise and distribute information well beyond their actual remit inside their closed systems.

Universities even in remote places usually have privileged access to information; they also have the knowledge and the manpower to produce scientific information through research. They can collect and select relevant information through the internet and many other channels, such as the personal networks of their teaching staff, who mostly hold at least some digital information. They can structure information according to their teaching needs. They could, per instance, structure the relevant information for the access exams and distribute it freely to everybody interested. This could greatly enhance the pool for new recruits and broaden and thus improve their student base by facilitating the preparation of candidates now excluded because they experience difficulties in accessing relevant materials to prepare for the exams.

Internally, universities (and other institutions) could structure the study materials for their courses and provide their complete syllabus offline digital to the entrants. As all courses and other educational programmes are already structured, if not always in the best way, this would be a fairly simple exercise which could greatly improve the quality of courses and level the playing field for students with more limited access to libraries and other sources of information. It would also greatly assist teaching staff and level out regional disparities in the quality of courses.

They could likewise translate the relevant texts into languages accessible to their students (and teaching staff). This is easy to do with the new translations engines available at low cost.

They could similarly transform relevant information into adequate forms, such as teaching material, student handbooks, research material and the like, and through all these combined processes validate information[54].

[53] For the online world, some of the biggest universities (more than 130 partner institutions) already offer free access to their courses, (MOOC) through online platforms (edx.org). Only certification has to be paid. These courses which are rapidly gaining large audiences, are however limited to users with functional online access.

[54] The COREECON project may serve as a good online example for providing complete teaching and study material for economics – maybe it could be put to use in offline distribution? (https://www.core-econ.org/).

As institutions of higher education enjoy privileged access to the use and dissemination of scientific literature their role could also be to legalise the use of the information; in this way the thorny questions surrounding copyrights and intellectual property could be solved[55].

Their role, however, does not have to be limited to act within the narrow boundaries of the closed systems. They could significantly expand their role to provide relevant scientific, technical and otherwise information to other institutions and to the wider public in general.

The content could be packaged according to specific needs and be distributed adequately. What hinders universities in areas with limited internet access to provide their student when registering with complete syllabuses of the courses in digitised formats on digital media? They could even provide them with a solar kit to provide the energy for their digital devices.

Specialized information packages, such as handbooks for mechanics, farmers, or woodworkers could benefit other professional groups. Here development actors of all types through their development projects which reach out to populations which are mostly excluded from internet access, could play a significant role by producing and distributing relevant digital information in most of their areas of intervention. The medical Wikipedia may serve as an example. It could become a standard equipment on the smartphones of all medical personnel, but also of teachers and others. Teachers of secondary and primary schools would certainly gain from specific information packages, as could for instance (rural) development and similar actors.

These institutions can also set up specific dedicated information delivery points where information can be copied. This does neither require specific technical installations, nor new distribution systems as existing infrastructures such as schools, shops, markets, etc. can be used. Existing distribution systems for goods and merchandise can also be used – it is to be seen if and what market forces will shape dissemination mechanisms. Social networks can also be used to distribute information which than can then travel to regions with no or low internet connectivity. It is to be expected that direct peer-to-peer offline data exchange of relevant scientific, technical and otherwise useful information will take off in an informal way as it already does for entertainment, such as the sharing videos and music.

There are also vast opportunities opening up for private enterprise within and outside of the formal economies that characterise many of the countries in the developing world. As digitised information can be reproduced error-free[56] without much initial investment and at reduced cost, there is a very low threshold for start-ups.

These should be able to provide services for all kinds of institutions as well as for end users of digital information.

The genie is out of the bottle – hopefully it only poses a threat to the business model of selling and controlling scientific information and not to science and knowledge production itself. Experience shows, that when new technologies can be put to bad uses, they will[57]. But there is always hope that their power can be put to good use, too.

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[55] The freely available scientific information on platforms such as academia.edu, researchgate.net or ssoar.info should pose no problems. A cooperation with relevant online editors could resolve the access problems to copyrighted materials. Other solutions have been proposed also (Warwick, 2014) but will probably not fit into institutional settings.

[56] This was not a given when manuscripts were still laboriously copied by hand; even typesetting of text was expensive and far from error- free.

[57] For one critical voice see: Jaron Lanier, who in his book "Ten Arguments for Deleting Your Social Media Accounts Right Now" puts the digitalised business model firmly as a cause for the negative dimension of the big internet

Concluding remarks

There is a huge need for scientific and technical information in areas that are not covered by the internet. The rapidly growing technological bases for the use of digitised information now reaches populations so far excluded from the digital world. Ever cheaper devices required for the use of information in digital format now become available also for people whose limited purchasing power allows them to acquire relevant devices such as smartphones or tablet and off grid solar energy systems.

The fall in costs for storage, transmission and use of digital information is an enduring phenomenon and will most likely continue. This helps to transform the real information needs into a growing demand for digitised information. This opens new opportunities on many levels for numerous actors.

For one, education systems in regions of the world that are mostly excluded from internet access can use digitised information offline. New models will have to be developed and propagated on all levels from primary to tertiary education.

Public and private administrations in regions not covered by the internet could also greatly benefit from a systemic access to offline digital information. So could private companies and professionals as well as people simply interested in information for different purposes – not least for self-study.

This also provides opportunities for entrepreneurial initiatives which can find markets for digital information outside the internet. As the initial investments are very low this also provides opportunities for start-ups in the poorer regions of the world.

New fields open also for all actors in international development cooperation, for international and national agencies as well as for non-governmental and civil society organisations which so far have mostly ignored the opportunities and potential which digitised offline information provides.

And last but not least, scientific research is required to define the potential in more detail, to develop models and to accompany the new developments.

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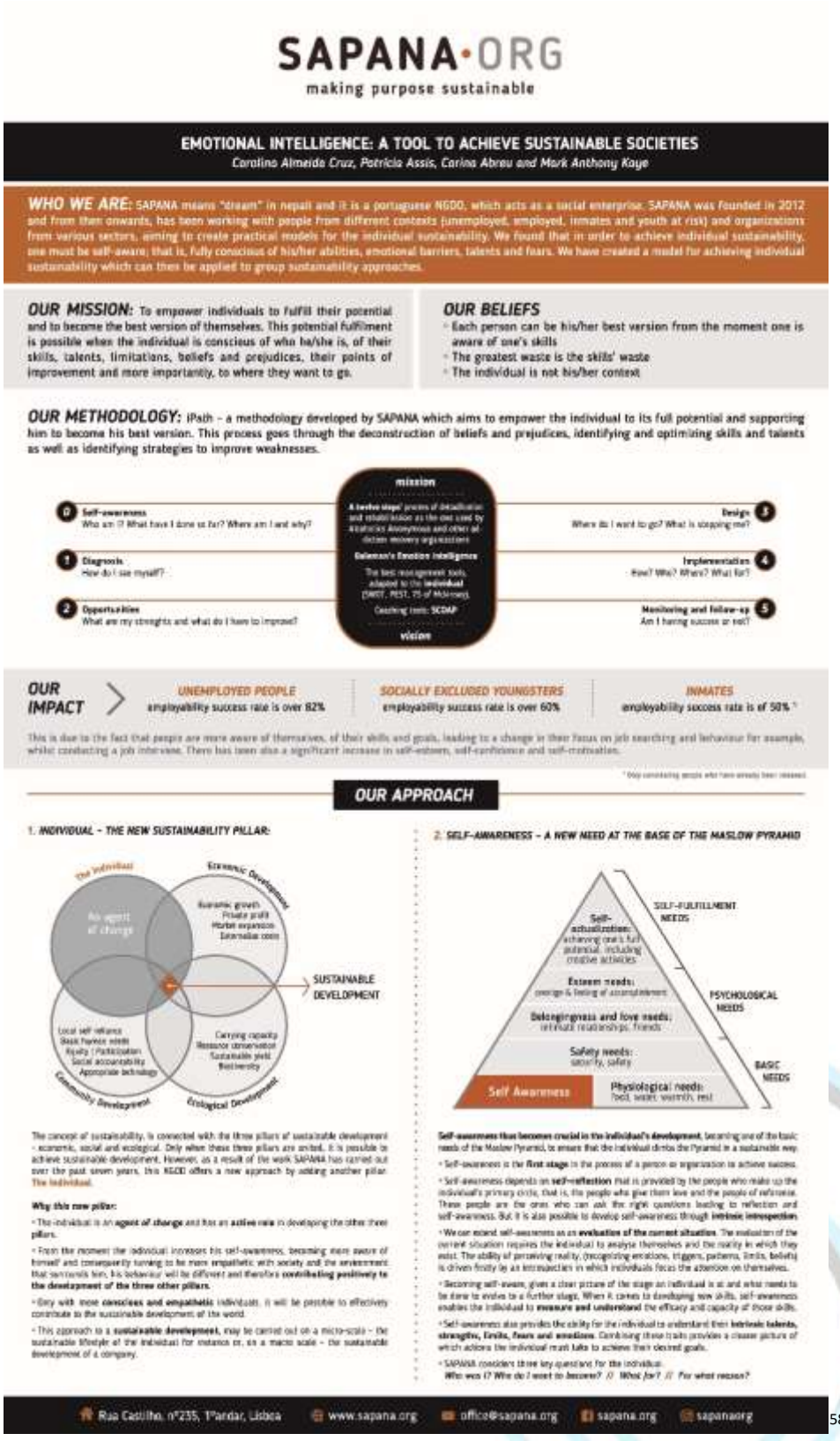
Conference Posters



[58]

[58] **Best Poster Award at GFIC 2019**

THE INFLUENCE OF CORPORATE REPUTATION ON PERFORMANCE: THE ROLE OF FINANCIAL AND NON-FINANCIAL INFORMATION

Keywords: Corporate reputation, performance, social and environmental disclosures and non financial information

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Consuelo Ruiz Rodríguez: mcruiz@ujaen.es
UJA

Background: Research project requested from 2019-2021

Gap:

Main topic: **reputation-performance relationship**

Contradictory evidences: sense and causality

Some ideas to explain these evidences:

-Reputation as an intangible asset

-Performance as a double dimension: financial and non-financial

-Longitudinal analysis required

In addition:

Voluntary disclosure as a mediator variable between reputation-performance relationship

Research objectives:

RESEARCH LINE 1: SED-REPUTATION RELATIONSHIP

There are more research lines in this project, that need objective 1 as its basis.

SED: social and environmental disclosures

01: To analyze non-financial disclosures as a moderator in corporate reputation-performance relationship

- To assess corporate reputation as an intangible asset, taking into account its character as a second order construct.
- To evaluate performance as a second order construct with financial and non financial indicators.
- To analyze the relationship between reputation and performance in a longitudinal study (5 years) and using SED as a moderator.

Methodological approach:

Literature review

- Academic databases: **WOS and Scopus**

Variables design:

- **REPUTATION RANKING:** MERCO Business Monitor
- **FINANCIAL MEASURES:** Financial statements and capital market data
- **NON FINANCIAL MEASURES:** voluntary disclosures via website

Research method

- **Structural Equations Models: Partial Least Squares (PLS)**

PROMOTING INTELLECTUAL CAPITAL
Pratical Aproach in Early Ages

CRITICAL CONTEXT

The trade-off hypothesis suggestion on memory /language skills;

The four C's demanded for future work challenges;

The human value that precedes technological skills.

Are Education thinkers taking into account the complex process towards maturity?

Are they reflecting on adequate skills?

Is the school paradigm meant to stay crystalized?

Is framing formal curriculum more important than increase teachers competences to guide students into new challenges?

Is information more critical than critical vision, creativity, communication or collaboration?

Why isn't Knowledge Management present during middle school?

Why do we only reflect about Intellectual Capital in universities and companies?

Do we actually realize the time and resources wasted during earlier ages in order to promote students assets?

CHECKLIST OF SUBJECTS THAT EVOLVED IN SCHOOL:

- Gender Equality ☑
- Environment sustainability ☑
- Sexual Education ☑
- Knowledge Management ☐

(...)

PRACTICAL APPROACH IN EARLY AGES

THIS IS A LOT OF QUESTIONING TO PROCESS, DON'T YOU THINK?

- Design and implement a project with simple but progressive goals, in order to monitor the value of knowledge over the years.
- Up closely supervise and guide teachers to potentiate children's unbiased brains.
- "Rewire" intellectual capital for the future.

References: T. Matsuzawa 2007; Harari 2018; M. Cabrita 2016; F. Matos 2016; A. Damásio 2003.

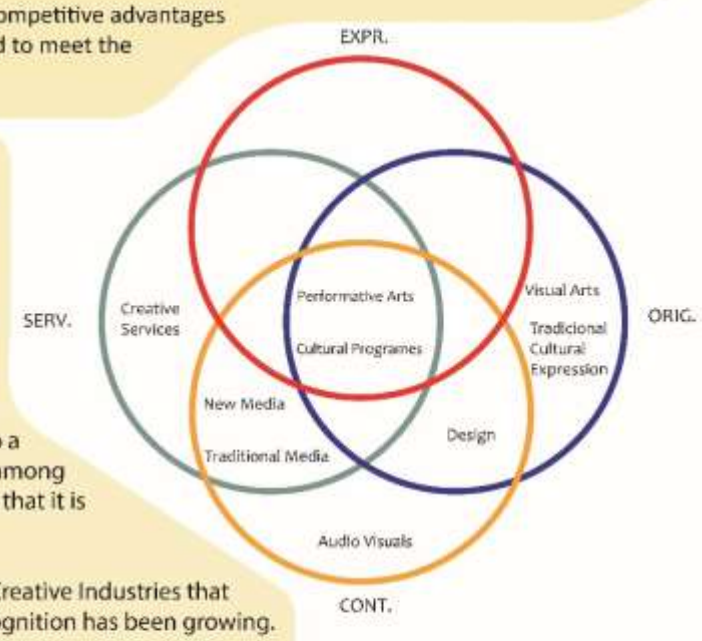
Gestão do Capital Inteletual nas Indústrias Criativas

Nádia Branco de Oliveira

- The theme Intelectual Capital Management (ICM) applied to companies in the area of Creative Industries it's not studied as much as thought.

- Creative Industries presente us with a complexity exact definition of it's sectors and profissional activities. But it brings new learnings and techniques that can innovate ICM methods and models.

- Through good ICM, companies can achieve competitive advantages compared to others, which is why they depend to meet the requirements of Work Market (WM).



- Knowing the importance of the human component in a company is essential if it is to surpass the difficulties and to understand where its value can come from.

- Knowledge is the material that provides the company with the creation of its value, and retention from knowledge obtained is essential to the company. It is fundamental to have knowledge transfer techniques, and also a good environment that is susceptible to this among its workers. And therefore ways to retain it, so that it is not forgotten.

- There are professional activities within the Creative Industries that occupy a more artistic position, and their recognition has been growing. Increasingly, these types of industries thrive in today's WM contexts.

- By addressing the public, they have to understand that the main function is to please the public by giving them the opportunity to participate in a cultural world.

- The ICM is applicable to these professional areas, but it needs to be further worked because they are very closely linked to a human work effort, which involves not only the body of artists but also those who help them in the assembly and performance of the show.

- It is, therefore, a teamwork between different departments, and therefore the human component of companies around this area is an essential element for their subsistence.

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SCIENCE-WITH-BUSINESS: Collaborative Advantage as a driver to Knowledge Transfer in a Digital Economy

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KEYWORDS
University-Industry collaboration // Strategic Alliances // Knowledge Transfer // Digital Economy // Digital collaborative advantage

PROBLEM

// The fourth ongoing industrial revolution is changing the paradigms in business theories and on how organizations create value and innovate.
// The world is changing fast and with it knowledge and innovation need to fasten their processes.
// University-Industry collaboration can be a powerful and effective tool in innovation and in knowledge transfer and is a major driver in the organization's competitiveness.
// Even though innovation is essential, most businesses, specially SMEs still lack the resources (human and financial) to undertake these collaborations in a systematic way or lack the capability to absorb the knowledge born from them.

RESEARCH QUESTION

How can we develop university-industry partnerships to potentiate knowledge transfer in a Digital Economy?

Based on the idea of collaborative communities (MILES, SNOW, FJELDSTAD, MILES, & LETTL, 2010), this organization design, combines organizational models both at the university and industry levels and establishes a real large scale multi-organization collaboration. The model is based on the principles of mutual beneficial interactions, sustained trust, supported common technology infrastructure for collaboration, collaborative protocols and a facilitative management philosophy and knowledge and other resources are «pools that all members can contribute to and draw from». (MILES, SNOW, FJELDSTAD, MILES, & LETTL, 2010)

Authors are unanimous when they state that the future competitiveness of firms/businesses and organizations lays in their ability to innovate. Yet, the digital transformation that we are living so fast only allows us to begin to understand the new ways through which knowledge is created and shared and the results of that in the innovation process. Organization's design faces the challenge of becoming more and more flexible, and more and more rapid in order to be able to answer the new challenges that appear every day. Digital shared-community-based organizational design forms are emerging, either formal ones nourished in firms, but also informal, user-born ones, that contribute to a faster co-creation of knowledge, and to the development of solutions that benefit the entire community and not only one firm or business.

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icaa INTELLECTUAL CAPITAL ASSOCIATION

linking art and territory

a visual case-study on the urban food system

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ART AND AESTHETICS

In an extensive literature review on studies of the food system, Brinkley (2013) identifies the cultural capital of food as one of the least explored themes. Steel (2008) points out how the History of Art expresses shifting attitudes towards food, but also of activities associated with the food system. Particularly with landscape painting, different 'visions' of cities and their rural hinterlands give an impressive account of land-use throughout history. Portraits and paintings of social settings also offer important insights into public and private food consumption habits and mores.
More recent examples testify an increased interest on other phases of the food system. Pop Art has celebrated commercialism, including food products, while photography has helped retain images of built structures often associated with food transformation.

TERRITORY, STRUCTURE AND INFRASTRUCTURE

The research of the Project 'SPLACH - Spatial Planning for Change' is directed towards a sustainable transition of Lisbon Metropolitan Area (AML) spatial planning. From our review of works of art representing some phase of the food system, we sought to organize images that allow an understanding of how the food system is implemented in the soil of the AML. We identified points of interest ranging from land-use distribution to infrastructure and elements of urban form - namely buildings in which activities related to the food system occur. From rural to urban land-uses, tsocial activities, as well as social conceptions of the adequate functions for urban soils are inherently linked with the distribution of food-related activites in the territory. As such, the pathway of food from the soil to the plate is one privileged area to conceptualize the relation of people with the urban territory.

production

Food production is one of the most demanding aspects of territorial management. Agricultural production will determine not only land-use distribution, but also land-use intensity. It is also where major differences between urban and rural spaces and activities emerge, as most production activities in the food system - mostly agriculture and livestock - are placed in rural places, and then transported to be consummed in urban areas. Recently, public initiatives of urban agriculture, as well as Guerrilla Gardening, are changing this paradigm and calling for more mixed urban spaces that acknowledge the importance of food production and green spaces within urban perimiters.

transformation

As many food products need transformation, as well as packaging and labeling before being consummed, transformation activities are important not only for the food system, but also for the maintenance of food habits. In spatial terms, transformation facilities are usually placed in industrial areas, planned for such uses, although food industries are not specified within spatial plans. Facilities for transformation include factories, silos and facilities aggregated to industrial livestock or agriculture.

distribution

As production and commerce are usually segregated in spatial terms, distribution plays a fundamental role in the functioning of the agrifood industry. Infrastructures such as highways and urban motorways, as well as railways, have a central importance in assuring that food production reaches communities living in urban perimeters, from which agriculture and livestock are usually absent. The mobility pattern implicit in this system is highly problematic in terms of CO_2 emmissions.

commerce

Food commerce is a fundamental part of any human settlement, proving access to food for locals and visitors. However, according to the needs of the current agrifood industry, most foodstuffs being commercialized are produced in distant locations. Different forms of labour are associated with different types of food outlets. In urban perimiters, these usually range from hyper and supermarkets to local marketplaces, convenience stores, shops, fairs and street-food selling points. Portuguese spatial plans do not separate food commerce from other commercial activities.

consumption

It is one of the most valued food-related activity in urban centres. It includes shops, restaurants and shoppings. It represents an important part of urban economy, creating jobs and exchanges.

Food consumption spaces play a fundamental role in the activities of urban perimeters, particularly centres. Public space is often used for extending consumption space into streets, squares and even gardens. Food consumption is also strongly associated with conviviality and social encounters.

waste disposal

Includes waste disposal and treatment facilities, with specific labour associated with it. Many facilities have been used for the creation of urban green areas, as is the case in Lisbon.

It is one of the least studied aspects of the food system (Brinkley, 2013). However, the utility of waste - particularly organic waste - for agricultural and livestock activities is considerable, and may play a fundamental role in creating short supply chains, with disposal aiding the production of new foodstuffs.

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