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INSTITUTO UNIVERSITÁRIO DE LISBOA

Paperless systems and their implementation: perceptions of non-teaching staff at Iscte

João Pedro Flores Diamantino

Master in Business Administration

Supervisor:
PhD Marjan Sara Fonseca Jalali, Associate Professor,
Iscte Business School

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Dedication and Acknowledgements

To my advisor Professor Marjan Jalali i would like to thank for all the support, availability and motivation. Her guidance allowed obstacles and hard choices became easier and was possible to achieve the goal.

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Resumo

Os sistemas sem papel têm vindo a crescer nas empresas e organizações num mundo mais digital. Os sistemas sem papel definem-se como a adoção de registos digitais sendo o papel cada vez mais um segundo plano. Torna-se importante perceber a implementação destes sistemas e os desafios na adoção destes sistemas nas empresas. A pandemia foi importante para explorar a tendência para uma estratégia digital no negócio. Este estudo pretendeu perceber a perceção do pessoal não docente acerca dos sistemas sem papel e implementação no Iscte – instituição de ensino superior. Estes são uma parte importante das organizações, especificamente as suas perceções, uma vez que permitem perceber os sistemas sem papel tendo uma visão de quem utiliza, providenciando conhecimento que permite à instituição evoluir. Foi adotada uma abordagem qualitativa e entrevistas semiestruturadas foram feitas ao pessoal não docente de diferentes serviços. As respostas desta investigação revelaram que apesar dos avanços no sistema sem papel os entrevistados sentem que ainda existe possibilidade de melhorar e de o aplicar em toda a instituição. No geral os participantes têm uma visão muito positiva sobre os sistemas sem papel e a sua funcionalidade durante e após a pandemia. A contribuição teórica relaciona-se com o estudo dos sistemas sem papel numa instituição de ensino superior. Estes não têm sido tão estudados nestas organizações e este estudo pretende colmatar essa falha. As contribuições práticas podem ajudar os gestores a compreender a importância da integração dos sistemas sem papel nas organizações, vantagens e desafios deste processo.

Palavras-Chave: Sistemas sem papel, Pessoal não docente*,* Iscte, Covid-19

Sistema de Classificação JEL:

I23 – Educação Superior • Instituições de Investigação
M10 – Geral

Abstract

Paperless has been growing in companies and organizations in an increasingly digital world. Paperless can be defined as the adoption of digital records, such that paper becomes a backup plan. It becomes increasingly important to understand the implementation of these systems and the challenges found in adopting them in companies. Covid-19 pandemic was a key factor accelerating the change to digital tools in companies. This study aimed to understand the perception of non-teaching staff regarding paperless system and it is implementation at Iscte – higher education institution. Non-teaching staff are an important part of the organizations, specifically their perceptions since they provide knowledge over the system and enable the institution evolution. A qualitative approach was adopted and semi-structured interviews carried out with non-teaching staff from different services within the institution. Findings showed that despite the advances in paperless system respondents feel there is still room to make it better and more universally applied. In general, participants` had a very positive view of paperless systems and their role both during the pandemic and after it. Theoretical contribution is related with the study of paperless in a higher educational institution. Paperless has not been studied as much in these organizations and this research aims to fill this gap. In practical terms this study can help managers to understand the importance of integration of paperless in organizations, the advantages and challenges of this process.

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UNECE - United Nations Economic Commission for Europe

3D – Three dimensions electronic system

DPOP - Digitalization and Paperless Office Program

I. Introduction:

Society and companies are increasingly connected with the use of technology. Digital economy embraces "economic relations that integrates mobile communications, information communication and Internet technologies" (Kobilov et al., 2022, p.375). According with Mamatzhonovich & Kamidovich (2022), this concept is growing at an ever-increasing pace. In this context, if companies want to be competitive, they have to adopt digital processes and implement document management systems (Jordan et al., 2022).

The idea of Paperless Office dates back to the 1970´s, when according to Yusoff & Sidhu (2002), it was defined as a system designed to send information easily, to enable the recovery of documents and even change the way people communicate, all done efficiently by using computers and digital equipment without the need to use sheets of paper. Notwithstanding, it was only during this century and the past fifteen years in particular, that the concept became more defined. In the last two years, with the Covid-19 pandemic, the theme earned a new importance and relevance in organizations.

During the pandemic period, organizations made significant changes. According to Pereira et al. (2021), the world shifted on different dimensions, mainly social and economic and had to adapt to the changes resulting from pandemic. Almost every company and organization had to change it is processes in order to reply with efficiency and effectiveness the limitations created by the COVID-19 virus. This change was often based on technology which hastily became the work basis of many organizations throughout this disruptive event (Vyas, 2022).

1.1 Definition and contextualization of paperless office

The definition of Paperless Office has been evolving since last century and will likely continue to evolve as technology development grows. In the 1980`s this concept was linked to the idea that "all forms of paper within an organization should be converted to digital format" (Hattingh, 2001, p.2). In the 1990´s with emergence of the internet and the creation of world wide web, the definition of this topic was swelled and changed to include supply chains which impact in the creation of branches and business expansion (Hattingh, 2001). In the 2000´s definition of paperless office was a "working environment where the creation, modification, storage, and retrieval of documents (electronic, graphical and virtual) happen electronically", such that employees who used paper before started using electronic documents and forms instead (Hattingh, 2001, p.2).

This topic is transversal to our society and has been receiving attention from both academia and management practice. Forbes magazine reported that in 2016, american organizations waste over 120 billion dollars on printed documents, most of them became outdated quickly, on average, ten thousand sheets are consumed per year, per employee (Xiong, 2020).

If a change is applied in business to reduce paper use, the potential impact will be very relevant to organizations. Some authors noted that "a worker takes an average of four hours per week looking for lost information " (Orantes-Jimenez et al., 2015, p.54). This study is aligned with the previous example, namely, changing and follow the trend of digital working processes allows to have a much better time workflow associated to a reduction in using resources such as paper and printing costs.

1.2 Objectives

The main objective of this research project is to understand the perception of the non-teaching staff regarding the paperless system and it is implementation at Iscte. Non-teaching staff are "persons employed by educational institutions who have no instructional responsibilities" (UNESCO, 2019,p.26). These staff are an important part of organizations and to understand their perception it is necessary to listen to them as they are system users and can give direct feedback over paperless system. As stated by Hendriarto (2021, p.164), "digitalization in business is a process that changes the pattern of communication, interaction and all the benefitis in business to digital". This digitalization in business has been applied on Iscte and the perception of non-teaching staff regarding paperless system is important to understand the benefit isand challenges through an inside view. Also refered by Hendriarto (2021, p.165) "the importance of computerized administrative affairs is to make it easier for secretaries or administrative human resources to take care of filing, administrative processes, and communications within and outside the company" Within this examples it is possible to understand the implications of paperless systems and the change on workflow inside the organization that paperless can offer to business.

The second objective is to analyze covid-19 pandemic and it is impact on paperless system at Iscte. According to Vyas (2022), covid-19 virus was responsible to introduce new ways or working, specially remote work and within that new challenges showed up: working hours and relation between employers and employees. Iscte was affected with pandemic and perception of non-teaching staff is important to understand the real impact on paperless system regarding pandemic because these employees of different services were the ones who spent more time out of office.

As digital processes, paperless systems in particular, grown in business, new questions arise regarding the processes through which they are implemented, the benefit is they bring, as well as the potential challenges they carry. As such, this study aims to examine these issues, specifically in the context of a larger higher education institution.

1.3 Research questions

The overarching is thus to understand Paperless systems and their implementation: perception of non-teaching staff at Iscte. Regarding this topic case study research was executed. Case study research can be defined as the investigation of "a contemporary phenomenon in depth and within it is real-world context" as well as the "benefit is from the prior development of theoretical propositions to guide design, data collection and analysis" (Yin, 2018, p.25).

This study was applied in Iscte due to educational institution dimension, is a public college specialized in different science areas, over ten thousand people linked with the institution; variety of services in the organization, allow a wide view throughout the organization; non-teaching staff perception is vital to understand paperless in ISCTE. This topic will be probe later on.

Specifically, we wanted to understand:

Research Question number 1 – What is the perception of the non-teaching staff regarding the paperless system at Iscte?

Research Question number 2 – What is the perception of the non-teaching staff regarding the implementation process of the paperless system at Iscte?

Research Question number 3 – What is the perception of the non-teaching staff regarding the impact of pandemic on paperless system at Iscte?

Regarding theoretical contribution to this investigation that is related with the study of paperless in an higher educational institution, that has not been the main focus of scientific publications. This study pretends to fill this gap by showing that paperless is important to companies and organizations. Nowadays society, organizations and companies are using more technology as digital systems has been growing worldwide. Paperless system as a digital system has gain importance to organizations. The need to be competitive in the market and following digital shift led organizations to use digital systems rather than using paper. Educational higher institutions are very important to society because they are responsible for knowledge transmission and personal development. To achieve the best performance in these specific tasks it is necessary to

keep up with technology improvements. To sum, adopting paperless systems in higher educational institutions is relevant and important.

Practical contribution to this investigation is related with managers and be able to help them to show the importance of implementing paperless in organizations. Organizations can vary in dimension, number of employees, availability of services, costs, location and other factors. To managers it is capital to balance profit and costs and within this specifically printing costs and paper costs are relevant to organizations. Paperless system is an alternative to reduce these expenses. If organizations want to maintain or improve their position in market, they need to follow the digital trend associated to business. According to this, paperless system can be a solution.

1.4 Dissertation framework

This dissertation is structured in five main sections, namely:

I. Introduction: contextualization and definition of the research questions, objectives and clarification of its importance and relevance as well as dissertation framework.

II. Literature Review: contains the scientific contextualization of the topic through a review of the relevant literature.

III. Methodology: describes the sample and data collection procedures as well as how it was subsequently analysed.

IV. Results and Discussion: the results obtained are analysed and discussed based on the research questions and their connection with the existing literature.

V. Conclusions: Enhance the conclusion of the study and relates findings with the objectives. Indicates the limitations to the results obtained and allow to pinpoint the gateway to future research.

II. Literature review

2.1. Paperless concept - evolution in time

The "Paperless Office" was an idea reported for the first time in 1975 by George Pake, head of Xerox Company, who was a very futuristic man as he foresaw the changes that would later appear in office. According with Septanto & Ananto (2015), Ragnet (2008) proposed the concept of "less paper office", explicitly how to use paper with more responsibility, by downgrading the amount of paper used and sucessfully promoting the upgrading of business performance focusing on communication, price and climate (Ragnet 2008, as cited in Septanto & Ananto, 2015).

According to Chapdelaine (1988), technology evolution instead of decreasing paper levels, caused the opposite, meaning that the use of paper increased. In 1988, costs with paper were the highest office consumer cost to companies. This was justified by the necessity of copies of important documents and the evolution of printers that gave the ability to the employee to easily print a large amount of paper copies faster than before. Paper files were the consuetude and besides the technology advances still existed a lot of resistance to paperless system (Chapdelaine, 1988).

As referred by Yusoff & Sidhu (2002), technologies worldwide were being updated at a high rate, paperless until this data has been an objective but was never accomplished. This is a pure reflection on the concept that has been growing since the 70´s but was far away from being used. In Australia the employees consumed over 30 kg of paper per year (Yusoff & Sidhu, 2002). Changing to paperless system, according to Yusoff & Sidhu (2002), has three major advantages: first is space saving that can be seen as United Services Automobile Association "saved 35.000 square feet of office space" (Yusoff & Sidhu, 2002, p.537). This space saving is also important because it allows organizations and companies to save money and to reduce the warehouse size. Second major advantage is much easier research because employees can have access to information faster as with digital systems is faster to find information than looking into different papers, which results in spending less time searching for documents or to recover lost documents. Finally, the third advantage is labor saving because the use of technology will require less human resources so organizations can save money on wages (Yusoff & Sidhu, 2002).

In 2006, paperless concept gained a new global perspective as United Nations Economic Commission for Europe (UNECE), published "A Roadmap Towards Paperless Trade". The core of this forum was to settle and determine what needs to be done to achieve a paperless trade worldwide. The discussion of paperless trade came up to a roadmap (Figure 2.1). To achieve paperless trade it is necessary: first to create a paperless customs declaration system to allow online data entry, then integrate the regulatory bodies and administrative in so customs can work together with this entities in the same system, following this is very important to expand the system to business communities to join them to the system and within save time in the trade process, trippingly is necessary to create a logistic national platform to foremost manage the import and export operations as all of information is concentrated in one system and finally link the national with the regional information exchange system so the system can work smoothly and with better efficiency.

Road towards paperless trade

1. Development of a paperless Customs declaration system

2. Integration of other administrative and regulatory bodies (engaged in export/import procedures)

3. Extension of the project to serve entire business communities (ports, airports)

4. Creation of an integrated national logistic platform, interlinking the administrations, companies and the service sectors to better manage the import/export operations

5. Integration of national logistic platforms into a regional information-exchange system
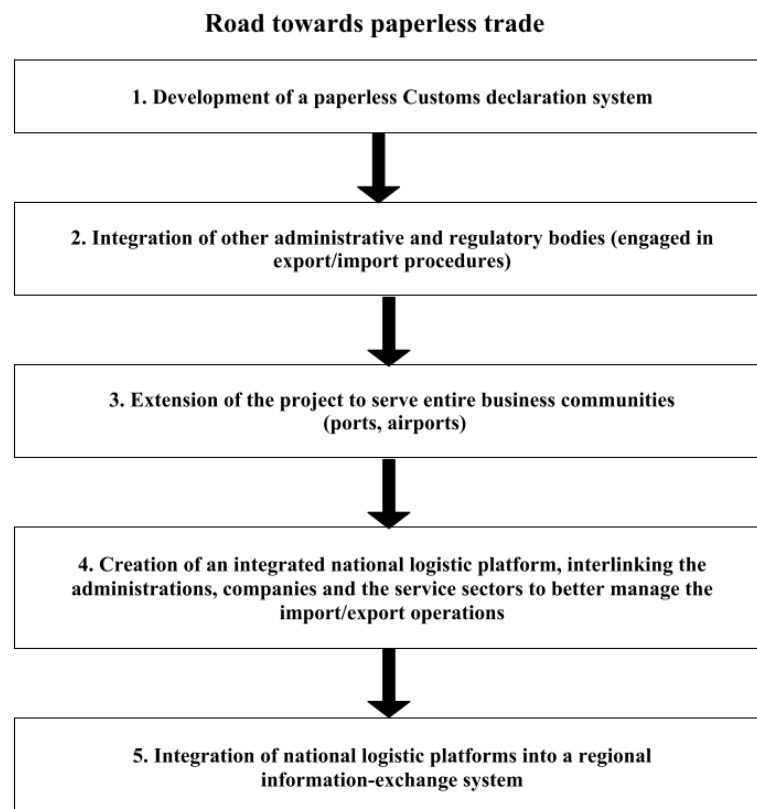
Figure 2.1 - Roadmap towards paperless trade

Focusing on the key charactheristics and steps to achieve and implement paperless in private sector, UNECE (2006), pinpointed the following main factors: Can increase efficiency of supply chains of companies and allow to add new value to the businesses;

Can save costs over processing paper; Enhance the use of a standard procedure and reduce errors and delays in data processing. This United Nations Forum shows the future goals that countries and economies want to achieve focusing on companies to achieve a global change. It is important to understand that in, 2006, countries were together in this goal of making paperless a true reality.

Going paperless is not the same process to every single business. Organizations vary in "culture, size, structure, processes, technology investments and resources"(Manzelli, 2010, p.3). The key to achieve paperless is a plan based on six aspects namely: goals, technology, team ,culture, timeline, and measurement process.

The first phase is to set business and personal goals as a team, by meeting with the different departments and listening to all stakeholders. As staff is engaged less resistance will appear throughout the process (Manzelli, 2010).

Second aspect is technology and it is important to identify and create a list with the use of each piece of technology inside business to understand future needs of the company.

Third step is the team, very important to guide the project. Composing the team must be considered four important roles: senior management – project leader that enhance the goals for all employees; internal champion – person in charge to execute the plan with permission to take action during the process; technology manager – this person can be also the previous one if the knowledge in technology is substantial, if not is the member that understands better the technology applied to business and finally role members – individuals with different points of view from distinct departments that surround the process and helps the execution (Manzelli, 2010).

Fourth step is culture, in which are linked communication and training. Communication is very important to transmit to employees what the company want to achieve and how to do it and facilitates the transition process. Training is fundamental as the employees understand and are more efficient with the new methodology (Manzelli, 2010).

Last steps and deeply connected are timeline and measurement. Timeline is important in order to set deadlines and goals to achieve the project. Measurement is also a key since the company can measure the progress of the implementation and do some tests in order to refine the details when the paperless method is fully applied in business (Manzelli, 2010).

As stated by Orantes-Jimenez et al. (2015), the starting point should be to set a strategy and the goals the organization want to reach. Within this should be considered to all parts of business such as premises, employees, policies and economic resources. Paperless in order to be achieved it is necessary that all actors pull to the same side, set a timeline, define responsibilities of each other involved in the process and pay attention to the cost of implementation. If each organization, follow these marks is possible to achieve paperless.

Currently paperless is defined as "a common term used to denote the adoption of full electronic records" (Yeng, Fauzi, & Yang, 2022, p.1).

Within this analysis of paperless concept since 1975 until 2022 it is possible to sum that the concept has been changing and refined and nowadays paperless is the use of full electronic records, leaving paper mentions in the definition of the concept. In the next chapter will be enhanced the relationship between Covid-19 and paperless.

2.2 Covid – 19 impact and opportunities to achieve paperless

Covid-19 pandemic appearance was a factor leading to intense and deep investigation and research in paperless. Implementation of digital systems is complex because involves several stakeholders with distinct preferences. Entropies can be generated as result of resistance to change to digital methods and due to employees that do not want to shift routines (Vendraminelli et al., 2022). As stated by Amankwah-Amoah et al. (2021), Covid-19 was the great accelerator to enhance the trend to change to digital strategy in business. Regarding covid-19 virus and business changes Vyas (2022), said that pandemic was responsible to introduce new ways or working, particularly remote work and the introduction of this new work typology new challenges showed up, namely, working hours and relation between employers and employees has changed.

Regarding the pandemic issue and linking with digital tools, one of them, is artificial intelligence that Gelashvili & Pappel (2021), decide to investigate the challenges to implement artificial intelligence in decision making processes towards paperless management in Georgia and Estonia. The results shown that the hurdles to implementation of the system were: probability of reducing number of employees, increased responsibility and lack of computer knowledge. The application of automated decision-making systems is not possible for now in Georgia and Estonia; they need more

development to be a reality, but covid-19 opened doors to the research as digital files became to be indispensable (Gelashvili & Pappel, 2021).

Also, another digital link are applications that improve the business activity of companies and organizations. Hendriarto (2021), studied the role of the digitalization in business model and innovation in Indonesia. The results shows that task, the implementation and activities regarding digital applications proved to be capable of overcoming hurdles in business operations in the pandemic phase. This line of tendency directly linked with digitalization was very good to support the business processes and give the capacity to adapt work in this challenging period of time. This digital trend is proven to be a way to reach business goals (Hendriarto, 2021).

Another perspective associated with pandemic is the digitalization of business as Amankwah-Amoah et al. (2021), studied that technology impact directly in work basis and companies strategies. This digital era can give opportunities, such as, digital document systems which allow employees to search and store information faster and more effectively and flexibility to employers that allow them to do homeworking. Nevertheless, the authors consider that digitalization has barriers such as the difficulty to separate work from daily life when working home and the business model of organizations that is still based on face-to-face meetings (Amankwah-Amoah et al., 2021).

Other interesting matter associated to paperless was the study from Oliveira et al. (2021). This research focusses the implementation of the DPOP (Digitalization and Paperless Office Program) in Portugal. Results of this study showed that DPOP has a good impact on organizations belonging to the most important economic sectors (education, health, trade, industry, and services) such as: increasing profitability, the image of companies are reinforced, the costs decrease (paper, energy) and has direct impact on sustainability and environment. This program also reduces paper consumption and is linked directly towards dematerialization (Oliveira et al., 2021).

This section reinforces the role that pandemic played in the development of different digital tools and bringing paperless closer to companies knowledge and appliance.

2.3 Advantages and disadvantages of paperless concept

In order to realize paperless concept and after being given an evolutionary perspective of the concept and also the impact of covid-19, it is important to understand potential benefit is and disadvantages of paperless concept.

The most predominant benefit is that were pinpointed by several authors were: environmentally friendly; process efficiency; process management and sharing. Explaining each one of them, starting with environmentally friendly: it is related with the reduction of paper usage which allow to cut less trees and diminish the water consumption. Secondly, process efficiency: the process of transmitting information thanks to paperless system is easier, faster and safer. Thirdly, process management was also highlighted since managing information is easier and tasks that need to be done can be executed with more quality. Fourdly, sharing information such as swap information with a co-worker, or a director is easier as can be done remotely instead of the employee time is saved and both can use the same digital platform instead of losing time searching for papers stored in different places. Control and security were also referred as documents are stored digitally and the possibility to lose information is lower than a paper that disappears unlike digital that as the possibility to recover information. Diversification as the number of options and services are wider, allow companies to offer more services to the final customer. Cost efficiency is related with space saving because documents are stored digitally and reduce employees because they are less required in offices and warehouses (Table 2.1).

Table 2.1 – Paperless system benefits

Paperless benefits	Author
Environmentally friendly	Duval & Simon (2021); Genesis & Oluwole (2018); Hattingh (2001); Prasetyo et al, (2020); Septanto & Ananto (2015); Soegoto & Luckyardi (2018);
Process efficiency	Hattingh (2001) ; Prasetyo et al., (2020); Septanto & Ananto (2015)
Process management	Hattingh (2001); Orantes-Jimenez et al., (2015) ; Septanto & Ananto (2015)
Resource efficiency	Hattingh (2001) ; Septanto & Ananto (2015)
Standardization	Hattingh (2001)
Market efficiency	Hattingh (2001); Orantes-Jimenez et al. (2015)
Sharing	Hattingh (2001) ; Prasetyo et al., (2020); Septanto & Ananto (2015)
Unlocking Information	Hattingh (2001) ; Yusoff & Sidhu (2002)
Control and Security	Orantes-Jimenez et al. (2015) ; Prasetyo et al. (2020)
Diversification	Orantes-Jimenez et al. (2015)
Space saving	Yusoff & Sidhu (2002)
Reduce people	Yusoff & Sidhu (2002)
Cost efficiency	Septanto & Ananto (2015) ; Prasetyo et al. (2020)

The most predominant disadvantages that were highlighted by different authors were: investment; lack of experience; training costs and loss of information due to virus or hack. Explaining each one of them, starting with investment: that is related with the cost of digital software and systems that are expensive and are not reachable to every single organization or company. Second disadvantage was lack of experience since the employees do not have experience in working with digital systems. Third disadvantage indicated was training costs because coaching an employee in digital system is costly and many of them resist to change. Loss of information due to virus or hack was indicated in if a virus or a hacker access the company information, the loss of information can be a huge problem, creating the disruption of the company (Table 2.2).

Table 2.2 – Paperless system disadvantages

Paperless Disadvantages	Author
Investment	Genesis & Oluwole (2018); Orantes-Jimenez et al. (2015); Prasetyo et al. (2020); Yusoff & Sidhu (2002);
Innovation	Orantes-Jimenez et al., (2015)
Overly Printing	Orantes-Jimenez et al., (2015) ; Prasetyo et al. (2020)
Lack of experience	Orantes-Jimenez et al., (2015); Prasetyo et al. (2020) ; Septanto & Ananto (2015) ;
Training Costs	Orantes-Jimenez et al., (2015) ; Prasetyo et al., (2020)
High levels of Information	Prasetyo et al. (2020)
Loss of information due to virus or hack	Prasetyo et al. (2020) ; Yusoff & Sidhu (2002)
Information delivery	Hattingh (2001)
Control and Security	Genesis & Oluwole (2018); Orantes-Jimenez et al., (2015) ; Prasetyo et al. (2020)

2.4 Digitalization and dematerialization

In association with previous chapter of Covid-19, pandemic allowed to emerge topics such as digitalization and dematerialization and associate these two concepts with paperless.

Probing this relation between concepts we can understand better the concept of digitalization, as "Digitalization refers to the technical process of converting analog or traditional paper-based tasks or processes to digital form" (Amankwah-Amoah et al., 2021, p.603).

By specifying the digitalization as an application of digital finance, this concept can be defined as "Digital finance means the availability of all financial products and services in an electronic form" (Rokade,2021,p.44). Within this is possible to associate the digital finance concept and the creation of a more sustainable work environment.

Digital finance can also be connected with five other aspects that relate intimately with paperless: less pollution as paperless system allow companies and organizations to reduce the levels of paper by using digital; less carbon emissions as levels of paper are

reduced; low carbon footprint as the necessity to cut trees to obtain paper is reduced which leads to a smaller ecological footprint; online information sharing as paperless system can reduce time in information searching and allows information to flow easily with more efficiency and corporate social responsibility as paperless have impact on environment by reducing the use of natural resources, using digital systems (Table 2.3) (Rokade, 2021).

Table 2.3 – Relation between digitalization and paperless system by Rokade, (2021)

Digital Finance aspect	Example	Paperless related
Less Pollution	Bank payment can be done at people own place.	Yes, because with paperless, pollution diminish as paper is reduced
Less carbon emissions	Online databases reduce the levels of paper	Yes, because using digital format reduce the paper levels and carbon emissions
Low carbon footprint	Using QR code decrease the levels of plastic	Yes, because the use of digital format reduces the dependence of trees to obtain paper.
Online Information Sharing	Digital finance allows sharing information easily, saving time	Yes, because using paperless is possible to reduce time and share information more efficiently
Corporate Social Responsibility	Digital finance relates with procedures and policies more eco-friendly	Yes, because paperless can save the environment by reducing the natural resources

Dematerialization concept can be defined as "synonym for the reduction in paper consumption and to refer to the consequences of the digitalization of information and the implementation of paperless policies in organizations and firms" (Oliveira et al., 2021,p.1).

Dematerialization of business enable companies to "modernize their administrative activities through the rationalization and optimization of information flows and elimination of documents circulating in paper format" (Ávila, Teixeira, & Almeida, 2018, p.121). This concept offers a new strategy to organizations and liking with paperless: standardization process as using a digital system, employees know where information is stored and where to find it as a clear process; customer service improvement as response to customer is enhanced by using digital system that allows a faster reply which impacts in higher service quality; multiple access, as a digital platform, different people can access by different locations at the same time information required to performs their work; reducing space as dossiers are no longer needed because information is digitally stored; saving costs and time as printing costs, paper costs are reduced and time as information is digital is faster to look and find information; communication as workflow is improved by using digital platform that enhance the communication between teams and members, customer service response is improved and availability of information as information unlike paper method is stored in one digital location, so availability is improved, time is saved in searching and efficiency is gained (Table 2.4) (Ávila et al., 2018).

Table 2.4 – Relation between dematerialization benefits and paperless system by Ávila, Teixeira, & Almeida, (2018)

Dematerialization Benefit is	Paperless related
Standardization process	Yes, because as a digital procedure employees all know where the information is stored and where to find it
Customer service Improvement	Yes, because paperless as a digital tool enhance a quicker response to clients
Multiple access	Yes, because people can access to digital information where they are without need to come to the headquarters
Reducing space	Yes, because is no longer need dossiers to store information as the workflow is digital
Saving costs and time	Yes, because save costs in storage space, paper costs, printing costs and time because access is much easier and no longer exists the necessity to find documents in more than one place
Communication	Yes, because people can talk with each other by digital applications which improves the workflow quality and speed response to customer
Availability of information	Yes, because as paperless system the information is stored digital is easy to find to search and it's not spreaded throughout office cabinets

Dematerializations limitations are paperless related such as: slow and gradual process as paperless adoption is a process that requires time and needs to be learned by the employees so is not a fast process and needs patience to be applied; initial investment is high as it is necessary to invest in software, backups and servers in order to store a huge amount of information and this process is expensive; inability to dematerialize completely as if digital system fails, paper is still a backup solution so it is not fully eliminated from the organization; instability in workforce, because older members are resistant to change habits and leaders force to change to digital systems, reduce availability of time and resources, because if small companies want to change to paperless is hard because requires time and money, that small business can't afford (Table 2.5) (Ávila et al., 2018).

Table 2.5 – Relation between dematerialization limitations and paperless system by Ávila, Teixeira, & Almeida, (2018)

Dematerialization Limitations	Paperless related
Slow and gradual process	Yes, because changing to digital requires time and a learning curve so is a slow process and it is gradual to implement
Initial investment	Yes, because paperless requires investments in digital equipment's (software and servers) that actually are still expensive to companies
Inability to dematerialize a process completely	Yes, as paper still is a backup plan if digital fails paper is still an option when digital is not available
Instability in workforce due to control	Yes, because older employees are more resistance to change costumes and habits and within leaders are controlling more.
Reduce availability of time and resources	Yes, because change to a digital format requires time and digital resources that in many cases small companies do not have money or the timeline to implement.

Comparing paperless, digitalization and dematerialization it can be concluded that: According to Mehdiabadi et al. (2022), paperless technology is an excellent tool in complex business areas such as economic and juridical. Also, the evolution of technological tools leads paperless to a superior level, supplying a huge variety for paperless offices and digital environments. Paperless has been implemented and when linked to technology advances there will be a growth in future as stated in "paperless technology will become much more widespread in future" (Mehdiabadi et al., 2022, p.9). To sum, paperless is growing and in future will be a reality through business and organizations even more than in present times.

Digitalization associated to business is growing as confirmed in "companies plan to invest more in digitalization in future" (Zauskova et al., 2022, p.121). Also, business in general wants to apply more digitalization. Like paperless digitalization exists is growing and in future will be more spreaded through business activity.

As said by Feghali, Matta, & Moussa (2022), dematerialization has been applied nowadays by organizations as many organizations are changing their processes to embrace dematerialization. Dematerialization is also growing as attested in "

dematerialization will make it possible to create new business processes and new accounting practices" (Feghali, Matta, & Moussa, 2022, p.239).

Like paperless and digitalization, dematerialization is also in a rising trend line. All three different concepts are applied actually and have perspectives to grow in future.

III. Methodology

This section presents the methodology applied to accomplish the objectives of this research, namely: understand the perception of the non-teaching staff regarding the paperless system and it is implementation at Iscte and analyze covid-19 pandemic and it is impact on paperless system at Iscte. Case study research was conducted in order to fulfil the objectives. In a case study research it is important to address a research design that makes the connection between data and the research questions (Yin, 2018). Considering the case study, a qualitative approach was taken. Qualitative methods can give a description in a complex situation, being possible to obtain different interpretations by different people with similar opinions or not (Sofaer, 1999). Interviews were used as they allow access to people´s perceptions, giving them space to freely provide their opinions about a theme. In particular semi-structured interviews were used as a tool to collect the data. According to Mcintosh & Morse (2015), in which the main charactheristics of semi structured interviews are described, namely: verify subjective answers from people regarding a specific theme; requires a detailed guide having flexibility on responses and participants are free to answer to open ended questions. With this research strategy is possible to achieve and understand of the perceptions of paperless in the organization, the process of implementing it and the advantages and challenges resulting therefrom.

Iscte is a public university covering diverse social sciences. It has over nine hundred collaborators, over nine thousand students and in total it has over ten thousand people linked with the institution. This is a very credible organization with various prizes and honours given to students and investigators, with regular presence in quality educational rankings and national and international recognition of the work done by this higher educational institution; is divided in five big services: "*Serviço de Gestão de Ensino*" (Academic Services); "*Serviço de Infraestruturas e Informática e Comunicações*" (Informatics Infrastructure and Communications); "*Serviço de Documentação e Informação*" (Information and Documentation); "*Serviço de Recursos Humanos, Compras e Espaços*" (Human Resources, Procurement and Property) e *"Serviço de Instalações e Equipamentos"* (Facilities and Equipment) (see Annex I). Within this, the investigation can be more specific and at the same time diversified by talking with different services. As doing this research in this important education institution and

talking with employees with different functions and positions, this study allows to understand better the challenges, limitations, opportunities and strengths of paperless process. Obtaining a more detailed perspective on paperless impact in each service, by the feedback given from each non-teaching staff, allow to understand better, paperless system at Iscte. Besides digital thinking in Iscte has been applied before, this can be seen in the following examples of paperless practice: grades are no longer posted in Iscte headquarters, grades are available online on platforms for example Fenix and e-learning; master thesis are no longer delivered in Iscte headquarters, the process is fully online and the work is delivered in Fenix; student scheduling regarding academic services is fully online with Fenix; fee payments are done in Fenix; candidature process is also submitted in Fenix. Within these examples several steps were made but there is still room to evolve and to expand paperless throughout Iscte.

Thirteen interviews, with employees from five different services of the organization were carried out. The aim was to have at least two people from each service, ideally from different hierarchical levels, although in practice, this was not always possible. The final sample was composed of thirteen participants (twelve female), two from each of the services except," *Serviço de Gestão de Ensino"* (Academic Services) and "*Serviço de Recursos Humanos, Compras e Espaços*" (Human Resources, Procurement and Property) from which three participants and four participants respectively were inquired (Table 3.1). Interviews were carried out between July and August of 2022, all in person at Iscte and lasted up to 30 minutes.

Table 3.1 – Interviewees List

Interviewee	Gender	Years in Department
A	Female	+ 25
B	Female	0-4
C	Female	20-24
D	Female	0-4
E	Female	5-9
F	Male	0-4
G	Female	0-4
H	Female	0-4
I	Female	0-4
J	Female	5-9
K	Female	0-4
L	Female	15-19
M	Female	+ 25

The purpose and description of the study and a consent form, (see Annex II), including an authorization to record the interview were sent to the non-teaching staff by email prior to the interview. All the participants accepted the conditions. The interviews were recorded and then transcribed for analysis.

Interview guide contained ten questions, regarding five overarching topics. The first two questions were quick answers related to understand how many years have the participants worked at Iscte and how many years worked in the department where they work actually. The other eight questions were open-ended. The second pertained participants` perceptions of the current status of paperless system within the organization. The third and four topics pertained participants`assessment of the system and the transition to it, respectively. Finally, the last section was about the impact of the pandemic on the application of paperless system (see Annex III).

IV. Findings

4.1 Paperless system - current status

To understand the paperless system, it was first necessary to understand how it is current status of paperless system perceived by non-teaching staff. In general, participants avow that paperless system is implemented at Iscte but recognize that the system has capacity to work even better and that can be further developed in future.

Analyzing, firstly, paperless examples in current department, E-Doc was referred by all interviewees, as they say it is a key system which allow the employees to have access to documents in digital support and it is transversal to various departments in Iscte.

"It was implemented E-doc system, which allow us to have access to documents that were previously available on paper are now available in digital format being this system transversal to all departments." (Interviewee quote)

Three dimensions electronic system (3D), that allow the design of any piece presenting height, depth and width was stated by two participants integrated in structure unit as they are mapping the organization in order to be much easier when they need to change anything in the building infrastructure or change furniture in a room. With this system the communication is much easier between departments and can be updated in a very short time.

Fenix System was cited five times. These participants recognise that Fenix System is very important for their daily work basis. For three out of five this system as the capability of manage students and within is very important to help these interviewees in managing of various student requests such as certificates, student-worker status, choosing the classes and timetable options, to communicate with the professors and to provide materials for students classes. The remaining two refer to Fenix system as a key system in their work basis as they work with space and the system is the key to coordinate people and space available for the classes, lectures, and events.

"Covid-19 came to trigger, by necessity, the dematerialization of the students academic requests that is, students can make requests on Fenix and have them answered

in Fenix. More recently we have dematerialized all certification requests on Fenix.''(Interviewee quote)

Online appointment system appears five times. Two interviewees referred that this system is very important because allow to set timetable, to make a reservation to a room inside the library and to manage the books loans and returns. The other three participants say that Online appointment system is vital since his creation with pandemic, to organize students scheduling and to avoid waiting time. When the student goes to the service, is attended at schedule settled before.

Online Candancy, a very important project for three participants, because allow the student to apply to a course, master's degree, doctorate degree and doing it at home, he submits the documentation all online.

Software/Data Base was mentioned by two people integrated in the information and documentation unit that refer software and data base as an important tool to do inventory and to organize archive because they have lots of stored information (Table 4.1).

Table 4.1 – Paperless system examples in current department

EXAMPLES IN CURRENT DEPARTMENT						
	E-Doc	3D	Fenix System	Online Appointment System	Online Candidacy	Software/ Data Base
Nº of Times Mentioned by Different Participants	13	2	5	5	3	2

Regarding advantages of paperless system, speed is universal among all participants as a advantage of the system because is faster to find information when compared to paper system.

" Speed is a big advantage as the response time is faster, analyzing documents is faster, everyone can find information faster without being dependent on paper (...). " (Interviewee quote)

Also universal is efficiency because with papers it is possible to lost them, do not knowing where it was stored and whitin this system is easier to know where to find information. Almost everyone except four interviewees, said that this new system is ecological because paper is no longer needed; by not using paper, the environment is more protected and trees are saved, so it is much better to use digital systems.

Six participants recognize that this system has the capability of assuring with more reliability the records control. If using a paperless system, it's all connected, the server and documents with people, so it is easy to control documents and avoid important loss of information. Four interviewees are the only ones that recognised that this system is cost saving because it can save a lot of money by not using paper because it is all-digital.

Ten participants said that the paperless system is easy to access. This can be assured by the use of technology because is easy to access, looking for some document and it's there in the digital system and not in some paper or dossier or storage or searching archive so is a big advantage of the system (Table 4.2).

" The fact that we have access to a lot of information in digital support is an advantage as time looking for some document is reduced by this availability (...)." (Interviewee quote)

Table   4.2 – Paperless system advantages

ADVANTAGES OF THE SYSTEM						
	Speed	*Efficiency*	*Ecological*	*Records Control*	*Cost Savings*	*Easy Access*
Nº of Times Mentioned by Different Participants	*13*	13	9	6	4	10

Talking about disadvantages of the system, two participants referred that paperless system did not have disadvantages. Ten interviewees stated expensive as a disadvantage of paperless as the cost to change and implement paperless actually is still high and costly to organizations.

" Yes it is an disadvantage because is not just the acquisition cost but also the maintenance of the equipment to stay updated" (Interviewee quote)

System failure was referred by eight people as if the system fails the option to solve the problem is to get back to paper which is not good because paper need still to be use so it is not eliminated fully. Paper as backup plan was cited by four individuals as a disadvantage because with the implementation of paperless system the previous paper method is not eliminated despite recognizing that paper levels are reduced with the use of digital.

Resistance of older employees to change was shared by four participants that transmitted that is a big deal when the idea of implementing a paperless system shows up, because older employees have more difficulties on changing work habit is and show resistance to step out of comfort zone. The learning curve was referred by three interviewees as the systems need time to be accomplished to be fully understandable so that is a disadvantage. Time to implement was a disadvantage that only two participants cited as it requires formation and the implementation is not immediately because needs time to be apprehended (Table 4.3).

Table 4.3 – Paperless system disadvantages

DISADVANTAGES OF THE SYSTEM						
	System Failure	*Paper as backup*	*Resistance of older employees to change*	*Learning Curve*	*Expensive*	*Time to implement*
Nº of Times Mentioned by Different Participants	*8*	4	4	3	10	2

Concerning examples of changing in daily basis work with paperless system, five interviewees indicated that there were no changes in the daily basis work as they already work with digital systems. Eight participants recognised that paperless system is much faster than paper system and that their daily work changed positively. Four interviewees

refer that this new system is better, and a big example is the efficiency of the system that allow to work at a higher level of performance.

"Help us a lot in dividing tasks, reorganizing work and we are more efficient as we work with digital system (…)." (Interviewee quote)

Only three participants considered that easy workflow was an example that changed their work and allow teams to be better organized. Two indicated that the paperless system changes mainly the access to information as it is easier to get the information needed with the application of this system. Flexibility was referred by two individuals as a major example to change their work because in case of foreign students, allows to have the capability of flexibility of information, meaning that students can reduced a lot their presence in the university.

Only one participant considered that 3D is an example that his work changed in daily basis because improves the work being faster and if any change happens is quickly added and updated (Table 4.4).

Table   4.4 – Examples of changing in day-to-day work with paperless system

EXAMPLES OF CHANGING IN DAY-TO-DAY WORK						
	Access to Information	*Speed*	*Easy Workflow*	*3D*	*Flexibility*	*Efficiency*
Nº of Times Mentioned by Different Participants	*2*	*8*	*3*	*1*	*2*	*4*

To sum, as mentioned before non-teaching staff considers that with paperless system it's possible to see the application of this system in their departments, paperless system has more advantages than disadvantages and finally interviewees can identify that with the application of digital systems the daily basis work has changed for better.

4.2 Paperless system – implementation process

To understand the paperless system implementation process, it was first necessary to understand how the transition process to paperless system was perceived by non-teaching staff and then the personal adaptation to the system. In general participants said that the transition process went well and the personal adaptation was good.

Towards the evaluation of transition process, three participants evaluate the transition process as excellent.

"Excellent, because the transition before it occurs people are informed, as well as the community, is given formation (...)." (Interviewee quote)

Most of the interviewees – eight evaluate the transition process as good. Only one considered that the transition process was middling. One participant said that the transition process was unsatisfactory. None choose the options stationary or poor (Table 4.5).

Table 4.5 –Evaluation of transition process to paperless system

EVALUATION OF TRANSITION PROCESS						
	Excellent	*Good*	*Middling*	*Stationary*	*Unsatisfactory*	*Poor*
Nº of Times Mentioned by Different Participants	*3*	8	1	0	1	0

Respecting personal adaptation to a new system, paperless, seven interviewees choose the option excellent to characterize personal adaptation to paperless system. Six people said that personal adaptation to paperless system was good.

"For me, from the moment that I saw, it was explained and then I started using it, it was a good adaptation (…)." (Interviewee quote)

None of the interviewees choose the options middling, stationary, unsatisfactory or poor to distinguish the evaluation of transition process to paperless system (Table 4.6).

Table   4.6 – Personal adaptation to paperless system

PERSONAL ADAPTATION TO NEW SYSTEM						
	Excellent	*Good*	*Middling*	*Stationary*	*Unsatisfactory*	*Poor*
Nº of Times Mentioned by Different Participants	7	6	0	0	0	0

Summarily, non-teaching staff considers that the transition process to paperless was in majority good. Personal adaptation to paperless system was evaluated with similarity between good and excellent, but excellent prevailed.

4.3 Paperless system – pandemic impact

To understand the paperless system pandemic impact, it was necessary to understand how the pandemic was perceived by non-teaching staff regarding paperless system. In general participants cited that pandemic had a good impact on transition to paperless system.

Regarding impact of pandemic in transition process, seven participants considered that the pandemic had a good impact on the transition process and the working processes got better with pandemic.

"We managed to provide a better service by having all information in the same place and I am sure that pandemic had a good impact so this started to happen (…). "(Interviewee quote)

Three interviewees did say that was an impact but at a middling level, but they recognized improvements Two considered that pandemic did not impact the process of transition. Only one considered that pandemic impact was excellent, workflow improved

a lot since the begging of Covid-19 and changes implemented showed to be important. (Table 4.7).

Table 4.7 – Impact of pandemic in transition process to paperless system

IMPACT OF PANDEMIC IN TRANSITION PROCESS						
	Excellent	*Good*	*Middling*	*Stationary*	*Unsatisfactory*	*Poor*
Nº of Times Mentioned by Different Participants	*1*	7	3	2	0	0

Pandemic impact on paperless system was good since interviewees refer that with this event workflow inside services and in the organization was improved. The main reasons to this change were due to remote work and the adaptation that was needed to use more digital systems as working, in a presential method was very limited and in some time was not possible. These changes allowed employees to have more flexibility, but they recognise to prefer working in a presential way.

Non-teaching staff considers that the pandemic impact in transition process to paperless was in majority good.

Interviewees also indicated some suggestions to paperless system. Two interviewees did not mention suggestions because in their opinion the system is going well as it is. One participant refers that a key point to improve will be single authentication because nowadays exists too may authentications and the reduction to a single one will improve substantially the workflow. Associated with this the communication between systems should be better to improve the response time, to benefit the faster access to information and upgrade the service quality. Three participants suggested to reduce paper levels that still exist.

"There is still a lot of information in paper , one suggestion is to reduce paper levels and use digital (…)"(Interviewee quote)

This change will improve the communication, quality and work efficiency. Two referred internet strength as a good improvement because Iscte use systems that require internet connection and in certain levels of the building the signal is not so good and the access to important information is affected by this lack of quality. Other one said that an important suggestion to future should be the application of sensors, lightening and air conditioner in rooms and offices. Seven interviewees said that the upgrade should be better communication between systems to improve the capacity of the system to work even better. Three interviewees stated digital procedures as an impact that will allow the teams to perform better and to achieve a higher level of service quality (Table 4.8).

To sum up, non-teaching staff considers that paperless system still have room to enlarge and gave suggestions in order to achieve better efficiency, better communication and improve service quality in the future.

Table 4.8 – Suggestions to improve paperless system

SUGGESTIONS TO IMPROVE THE SYSTEM						
	Single Authentication	*Better communication between systems*	*Reduce Paper*	*Internet Strength*	*Sensors*	*Digital Procedures*
Nº of Times Mentioned by Different Participants	*1*	7	3	2	1	3

V. Discussion

5.1 Perceptions of paperless system

In order to better notice from non-teaching staff perspective, how paperless system is perceived, it is necessary to analyze and discuss the results obtained.

Regarding our study the results showed that non-teaching staff perceived that Iscte has a paperless system implemented, still with room to improve and if government gives support to higher education institutions, this implementation could be faster and transversal through all institution as Iscte is a public institution. It was also referred that Iscte has plans to implement measures that will lower energy costs such as sensors to regulate energy consumption. According to Asim & Ahmad (2022), that conducted a study in universities libraries of Pakistan, the authors concluded that in general knowledge, technology for paperless and capacity to implement paperless environment is still at reduce levels. Despite geographic differences and level of implementation of paperless system it can be said that both realities apparently need to be supported, so paperless system can be spread in university basis.

Asim & Ahmad (2022) research, imply that government need to support these institutions so they can be capable of using paperless by better applying the resources available. Directly related with resource management, is energy saving that is important as libraries operates for many hours. So the big challenge is changing from paper to digital. These libraries could use in future laptops, document scanning and e-books as strategies to achieve paperless (Asim & Ahmad, 2022).

This study showed also that Iscte already has different digital tools implemented in the various services, namely, E-doc, Fenix System and the Online appointment were the most mentioned systems. All of these systems allow to non-teaching staff the ability to share documents, manage students processes; and in the specific case of online appointment system is possible to schedule time and day for students get support from the academic services.

On the other hand, according to Villarosa (2021), he study the development of a record archiving system in eastern Visayas State University. This researcher provides a paperless record management system to this university with capacity to store and find the information easily and with a proper backup database. The conclusion within is that paperless was proposed through this record system and the system will be used in future.

However, Iscte study and Villarosa study present a slightly difference that Iscte already have a paperless system implemented and Visayas State University only in future will benefit from having a paperless system with capacity to store electronic information and reduce paper levels.

Our study presented likewise some examples of changes felt by non-teaching staff in their daily basis routine. Speed and easy workflow were the most shared by the participants. With paperless system it is faster to look and find information and this system allows the workflow to be easier as tasks are performed rapidly. As stated Kayode et al. (2020), which studied the paperless environment in Nigerian public Universities they concluded that the implementation of paperless environment will benefit the information flow and will improve the educational system. However, in order to implement this system in general, not just in specific cases, is necessary that government helps these institutions with more money and real intent to change to this system. Paperless it is being implemented in Nigeria but at slow rhythm and needs some incentives and efforts from politicians so this system can be a reality in a more global way. Iscte study is aligned with Kayode et al. (2020): paperless system benefits the information flow and consequently improves the educational system.

Reviewing the data collected from interviews and the scientific data presented, it can be concluded that the perception of non-teaching staff on paperless system at Iscte is good, but could be much better since paper is still used in services as backup plan. Iscte and universities in general need government support so these institutions can apply and benefit from paperless system.

5.2 Implementation of paperless process

In order to understand the implementation process regarding perception of non-teaching staff on paperless system it's necessary to discuss the results obtained from the interviews.

Our study regarding the implementation of paperless process showed that paperless system has advantages and disadvantages but non-teaching staff recognize that paperless system has more advantages than disadvantages. The most relevant advantages to them were speed, efficiency and easy access. The most relevant disadvantages mentioned were expensive, system failure and resistance to change. According to Denna & Maatuk

(2021), that studied the application of electronic records in polyclinics, it can be highlighted the following benefits: reduce errors, reduce costs, data exchange is easier and is safer. On the other hand, this study also demonstrates some barriers to the appliance of electronic records such as: lack of digital skills, system cost, privacy issues, adaptation to new technology. Our results seem to be aligned with the authors study due to the recognition that paperless presents more benefits is than harms and non-teaching staff recognize similar benefit and harms, according with the information shared by the authors.

Interviews at Iscte revealed that ecological: paper amount are highly reduced being paperless an ecological solution, as trees are saved and the ecological path is diminished; cost savings: which relates with saving money; efficiency: know exactly where is the information stored and is easier to find information; are three important advantages cited by the interviewees. Regarding disadvantages the interviews revealed that system failure: directly related with lack of internet connexion and low capacity of working with different digital systems; paper as backup plan, once digital fails the option is to get back to paper base work as backup plan to solve the issue. These two disadvantages were important to interviewees. As stated by Lindov, Osman, Kosovac, Amel, Kosovac, (2022), in the study of industry 4.0 in transport and logistics, authors refer the following benefits of e-document introduction: saving money in transport, less business compliance costs and protecting the environment and finally the transport savings Paperless as a system to apply in organizations allow much more efficiency when compared to the previous paper-based system. In contrast and related with 5G network some barriers are referred such as: the quality of network coverage, is a process that will take much time to implement and the interoperability between several networks. Iscte case and transport and logistics case seem to indicate similar advantages and disadvantages of paperless system.

Non-teaching staff evidenced easy access, cost savings and speed as some advantages of paperless system at Iscte. With this system information is available in one place and it is easy to search and to find information, allow to save money as printing costs and paper costs are reduced and it is faster to use the system compared to previous paper method that required more time to find information. Following the thoughts of B. Agosto, (2022) in which were studied two different databases to apply paperless to an aerospace company, the author concluded that one of them named Epic was more user friendly, database was simple and can be linked with other databases. These results show

similarity in the advantages of using paperless in organizations referred by the interviewees and the advantages pointed by the authors who studied Epic.

Linking the information obtained from interviews and the scientific data presented is possible to conclude that non-teaching staff of Iscte had a good perception on paperless system implementation process recognizing several advantages but also demonstrating that this system had disadvantages. Besides that, the system had a positive impact to non-teaching staff and in future paperless system will enhance even better the applicability of the system to the different services at Iscte.

5.3 Paperless and pandemic changes

The study realized at Iscte in which it was studied the perception of the non-teaching staff regarding the impact of pandemic on paperless system showed that pandemic was good and allowed the different services to gain flexibility in workflow, with the use of different online platforms and the possibility to work remotely, reduce paper consumption levels and save costs with the transition to a digital system using less paper. As referred by Hussein et al., (2022), which studied the role of covid-19 in moving towards paperless, the author, concluded that the impact of the virus revealed a large cutback on paper and reduction of costs. Also, Covid-19, forced the institution to adopt digital, with the big change to be the online systems to maintain classes and lectures, as students were home. Beside this rapid change it allowed to accelerate the process to adapt to paperless and increase the capacity to save the environment by reducing the paper use.

Iscte study and the author study approached the same points regarding pandemic impact on paperless systems.

Interviews of non-teaching staff at Iscte demonstrated that Iscte needed to adapt very quickly to a new way of working due to the pandemic. Remote work was a solution adopted by Iscte during and after lockdown being the timeline different depending on the services. The employees liked to work home, however recognize that managing work and family in the same place is not easy. The interviewees prefer to work in presential mode. As cited by Rai, Alka; Maheshwari (2022), which studied the response of a corporation against the covid 19 pandemic, the authors concluded that it was a huge challenge to maintain the activity during the pandemic. Also, remote work was not adopted on regular basis by this corporation before pandemic. The company decide to implement remote work and the results were surprisingly good. The remote work was spreaded over

different locations and departments and the performances were very good, on reducing paper use. However, the corporation concluded that the remote work if it is fully applied, will reduce human interactions which is not good and will have employees more hours looking at screens with effects on productivity, mainly on older workforce. Iscte non-teaching staff evaluates as good the transition process of paperless systems and its impact. Iscte seems to be aligned with the authors concerning remote work.

The study of the impact of pandemic on paperless system realized at Iscte revealed that technology and the introduction of digital systems was a reality in response to the pandemic. Online Appointment System is a good example of a system that since his creation with pandemic was vital to organize students schedules to avoid waiting time. The appointment was scheduled (day and hour) and the student attend the service at the agreed timetable. According to Regnier et al., (2022), which studied the response on education from Covid -19 the authors concluded that pandemic had a result on the higher level of application of technology in education. Three major technological practices were enhanced from this study: digital chalk boards and the ability to explain with screen sharing, remote participation in classes, to improve the connection between professor and student, paperless classroom which increase withdrawal from classes and good response to the virus.

Feedback from interviewees showed that the impact of pandemic was good, once the use of technology during and after the lockdown was referred as crucial tool. During the lockdown to maintain the work levels and after to enhance flexibility of work and using technology to solve issues without need to be present in office.

VI. Conclusions

Paperless can be defined as the adoption of digital records, being that paper becomes gradually to be used as a backup plan specially in cases of digital system failure. Technology and digital systems are more and more important for the society development. Paperless systems have been growing specially in companies and organizations in an increasingly and rapidly digital world. Associated to this it becomes necessary to understand better the implementation of these systems, the challenges and opportunities of paperless process to institutions and organizations. Covid-19 pandemic changed the world and led to intense and deep investigation and research in paperless. This virus was a key factor to accelerate the change and the increase use of digital tools in companies and organizations. Covid-19 associated with lockdown in specific, in which every single individual had to stay home was responsible to introduce new ways of working, the most notorious was remote work therefore new challenges showed up. It was necessary to balance family and work at the same time. Digital workflow gained relevance to companies and institutions when decided to implement digital systems.

This study, considering the growing importance of this topic to society, specially to organizations and institutions and the lack of specific information to these systems applied in higher educational institutions, aimed to investigate - Paperless systems and their implementation: perceptions of non-teaching staff at Iscte – higher education institution. Bearing in mind that non-teaching staff are an important part of organizations, specifically their perceptions, once they enable to understand better paperless system by being in contact with the system and providing knowledge over the system. This enables the higher educational institution - Iscte to evolve, regarding these systems. Regarding the research questions of this study, were formulated three research questions.

Considering the first one, that was *"What is the perception of the non-teaching staff regarding the paperless system at Iscte?"* it was analyzed the general perception that non-teaching staff had regarding paperless system. To understand the paperless system, first was necessary to understand how it is the current status of paperless system perceived by non-teaching staff. In general participants confirm that paperless system is implemented at Iscte but recognize that the system has capacity to perform even better and that it can be further developed in future. Detailing the process and using a qualitative approach, semi-structured interviews were carried out to non-teaching staff from different services

at Iscte representing thirteen participants. It was asked to non-teaching staff if they could identify examples of paperless inside their department. The top answers were E-doc, Fenix System and Online Appointment System, three important examples of digital systems applied to Iscte and very important to non-teaching staff as they are vital systems for their work basis. Then was asked advantages of paperless system. The top answers were speed, efficiency and easy access.

Non-teaching staff enhance these three as big advantages of paperless system because is faster to look and find information; is easier to know where to find information needed and if looking for some document and it is there in digital system and not lost in archive. Trippingly was asked disadvantages of paperless system. The top answers were expensive, system failure and paper as backup. Non-teaching staff evidence these three as big disadvantages of paperless system, because cost to change and to implement paperless is still high, if system fails the option to solve the problem is to get back to paper, so it is not eliminated fully, and paper as backup is not eliminated yet, despite paper levels are being reduced. Finally associated with this research question were asked examples of changing in daily basis work with paperless. The top answers were speed, efficiency and easy workflow. Interviewees reported that paperless system is much faster than paper system and their daily work changed positively, efficiency as this system allows higher performances and easy workflow because allows teams to be better organized.

The second research question was *"What is the perception of the non-teaching staff regarding the implementation process of paperless system at Iscte?"*. To understand the paperless system implementation process first is necessary to know how the transition process was perceived by non-teaching staff and their personal adaptation to paperless system. In general, non-teaching staff confirm that the perception of implementation process was good, specifying that transition process went well and the personal adaptation to paperless system was excellent. It was asked to participants how they evaluate the transition process to paperless system. The top answer was that the transition process was good. Regarding personal adaptation to this new system it was asked to non-teaching staff their perception, excellent was the top answer.

The third research question was *"What is the perception of the non-teaching staff regarding the impact of pandemic on paperless system at Iscte?"*. To understand the paperless system pandemic impact, it was necessary to comprehend how the pandemic was perceived by non-teaching staff regarding paperless system. In general, participants

confirm that pandemic had a good impact on transition to paperless system. It was asked to the participants the impact of pandemic in transition process and the top answer was good. Participants refer that paperless system still needs to grow and they referred suggestions to the system: better communication between systems, reduce paper and digital procedures, were the top answers.

Limitations to this study were the interviewees chosen, because it was not possible to interview directors and employees of all departments; small sample; single organization focus – Iscte; studying a specific organization and not having extended to more institutions.

Theoretical contribution of this investigation is related with the study of paperless in a higher educational institution. Paperless has not been studied as much in these organizations and this research intended to fill this gap. By doing this study it was shown the importance and relevance of studying paperless system in higher educational institutions, as these systems gain importance to organizations and institutions because it is necessary to be competitive in the market and follow the digital trend in business. Practical contributions of this investigation are related with helping managers to show to them the importance of the integration of paperless in organizations, a system that has more advantages than challenges. As managers want to control costs in the organizations, paperless system is an alternative to reduce printing costs and paper costs.

Considering the results obtained in this research it is important to realize other studies with bigger samples, gathering all stakeholders feedback over the application of this systems. These new studies will enhance, and it will be possible to understand even better paperless system and stakeholder's perception in full at Iscte, in organizations and companies and apply the acquired knowledge to improve and use paperless systems in firms and institutions.

VII. Bibliographical references

Agosto, B. T. (2022). *Paperless Harness / Cables Fabrication*.

Amankwah-Amoah, J., Khan, Z., Wood, G., & Knight, G. (2021). COVID-19 and digitalization: The great acceleration. *Journal of Business Research*, *136*(July), 602–611. https://doi.org/10.1016/j.jbusres.2021.08.011

Asim, M., & Ahmad, P. (2022). Adopting Green Practices : Challenges for University Libraries of Pakistan DigitalCommons @ University of Nebraska - Lincoln Adopting Green Practices : Challenges for University Libraries of Pakistan. *Library Philosophy and Pratice*, *June*.

Ávila, L., Teixeira, L., & Almeida, P. (2018). A methodological approach to dematerialization of business processes using open-source technology. *International Journal of Industrial Engineering and Management*, *9*(3), 121–128. https://doi.org/10.24867/IJIEM-2018-3-121

Chapdelaine, S. A. (1988). Short Subjects : The Paperless Office : Hope for the Future or a Grand Illusion? *Journal of the Society of Georgia*, *6*(2), 35–42.

Denna, I., & Maatuk, A. M. (2021). *Application of Electronic Health Records in Polyclinics : Barriers & Benefits*.

Duval, Y., & Hardy, S. (2021). *A primer on quantifying the environmental benefits of cross-border paperless trade facilitation* (Number 206). https://doi.org/10.1787/9789264101371-en

Feghali, K., Matta, J., & Moussa, S. (2022). Digital transformation of accounting practices and behavior during COVID-19: MENA evidence. *Journal of Accounting and Management Information Systems*, *21*(2), 236–269. https://doi.org/10.24818/jamis.2022.02005

Gelashvili, T., & Pappel, I. (2021). Challenges of transition to paperless management: Readiness of incorporating AI in decision-making processes. *2021 8th International Conference on eDemocracy and eGovernment, ICEDEG 2021*, 41–46. https://doi.org/10.1109/ICEDEG52154.2021.9530905

Genesis, E., & Oluwole, O. (2018). Towards a "Paperless" Higher Education System in Nigeria: Concept, Challenges and Prospects. *Journal of Education, Society and Behavioural Science*, *24*(2), 1–15. https://doi.org/10.9734/jesbs/2018/19913

Hattingh, M. (2001). The features and impact of the paperless office, with specific reference to the City of Johannesburg. *SA Journal of Information Management*, *3*(3/4). https://doi.org/10.4102/sajim.v3i3/4.147

Hendriarto, P. (2021). Understanding of the role of digitalization to business model and innovation: Economics and business review studies. *Linguistics and Culture Review*, *5*(July), 160–173. https://doi.org/10.37028/lingcure.v5nS1.1347

Hussein, B., Jaberi, A., Sedaghat, M. M., Almallahi, M. N., Alsyouf, I., Abdel, I., & Ibrahim, S. (2022). *The Role of Covid-19 in Moving Towards a Paperless Campus : The Case of University of Sharjah*.

Jordan, S., Sternad, S., & Šišovska, I. (2022). *Document Management System – A Way to Digital Transformation*. *68*(2), 43–54. https://doi.org/10.2478/ngoe-2022-0010

Kayode, A. A., Lawan, B. M., Ajadi, A., & Adams, J. (2020). *E-Government , Information and Communications Technology Support and Paperless Environment in Nigerian Public Universities : Issues and Challenges*. *1*, 65–74.

Kobilov, A. U., Khashimova, D. P., & Gaybullaevna, S. (2022). *International Journal of Multicultural and Multireligious Understanding*. 375–378.

Lindov, OSMAN, Kosovac, Amel, Kosovac, A. (2022). *A new step forward of Industry 4 . 0 in transport and logistic Related papers*. https://doi.org/10.5644/PI2022.202.26

Mamatzhonovich, O., & Kamidovich, O. dematerialization and digitalization/288-811-1-P. pd. (2022). Digital Economy: Essence, Features and stages of Development. *Academia Globe: Inderscience Research*, *3*(4), 355–359.

Manzelli, J. (2010). Building Your Bullet-Proof Plan for Paperless Practices. In *New York*.

Mcintosh, M. J., & Morse, J. M. (2015). Situating and Constructing Diversity in Semi-Structured Interviews. *SAGE Journals*, *2*, 1–12.

https://doi.org/10.1177/2333393615597674

Mehdiabadi, A., Shahabi, V., Shamsinejad, S., Amiri, M., Spulbar, C., & Birau, R. (2022). Investigating Industry 5.0 and Its Impact on the Banking Industry: Requirements, Approaches and Communications. *Applied Sciences (Switzerland)*, *12*, 1–25. https://doi.org/10.3390/app12105126

Oliveira, J., Azevedo, A., Ferreira, J. J., Gomes, S., & Lopes, J. M. (2021). An insight on B2B Firms in the Age of Digitalization and Paperless Processes. *Sustainability*, *13*, 1–21. https://doi.org/10.3390/su132111565

Orantes-Jimenez, S. D., Zavala-Galindo, A., & Vazquez-Alvarez, G. (2015). Paperless Office: A new proposal for organizations. *IMSCI 2015 - 9th International Multi-Conference on Society, Cybernetics and Informatics, Proceedings*, *13*(3), 47–55.

Pereira, C. S., Veloso, B., Durão, N., & Moreira, F. (2021). The influence of technological innovations on international business strategy before and during COVID-19 pandemic. *Procedia Computer Science*, *196*(2019), 44–51. https://doi.org/10.1016/j.procs.2021.11.071

Prasetyo, S. E., Mada, U. G., Kusumawardani, S. S., & Mada, U. G. (2020). *A Review of The Challenges of Paperless Concept in the society 5.0. 2*(July).

Rai, Alka; Maheshwari, S. (2022). *Understanding the response plan of corporation against COVID-19 : a case of Indian power major*. https://doi.org/10.1108/TLO-05-2022-0053

Regnier, J., Shafer, E., Sobiesk, E., & Haynes, M. (2022). *Bouncing Forward from COVID in Higher Education*. *ITiCSE 2021*, 73–77.

Rokade, E. (2021). *Digital Financial Inclusion : An Umbrella for Environmental Sustainability*. *X–III*(II), 42–58.

Septanto, H., & Ananto, P. D. (2015). *Multimedia Based Application Design of Selection Examination As a Support for Paperless Office in Ppkd East Jakarta*. *August*, 125–133.

Soegoto, E. S., & Luckyardi, S. (2018). Going paperless: Executive information system

toward digitalized universities management. *IOP Conference Series: Materials Science and Engineering*, *434*(1). https://doi.org/10.1088/1757-899X/434/1/012165

Sofaer, S. (1999). Qualitative methods: what are they and why use them? *Health services research*, *34*(5 Pt 2), 1101–1118. http://www.ncbi.nlm.nih.gov/pubmed/10591275%0Ahttp://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=PMC1089055

UNECE. (2006). *A Roadmap Towards Paperless Trade: Vol ECE/TRADE*.

UNESCO. (2019). *Instruction Manual - Survey of Formal Education* (Number October, bll 1–40).

Vendraminelli, L., Macchion, L., Nosella, A., & Vinelli, A. (2022). Design thinking: strategy for digital transformation. *Journal of Business Strategy*. https://doi.org/10.1108/JBS-01-2022-0009

Villarosa, E. (2021). Developing a record archiving system in eastern visayas state university -Burauen Campus. *Journal of Advanced Academic Research*, *9*(November).

Vyas, L. (2022). " New normal " at work in a post-COVID world : work – life balance and labor markets. *Policy and Society*, *41*(January), 155–167.

Xiong, E. (2020). *Going Paperless: A Journey Worth Taking*. 1. https://www.forbes.com/sites/forbestechcouncil/2020/04/02/going-paperless-a-journey-worth-taking/?sh=2fc9fab95ca1

Yeng, P. K., Fauzi, M. A., & Yang, B. (2022). A Comprehensive Assessment of Human Factors in Cyber Security Compliance toward Enhancing the Security Practice of Healthcare Staff in Paperless Hospitals. *Information*, 1–22. https://doi.org/10.3390/info13070335

Yin, R. (2018). *Case Study Reserach and Applications- Design and Methods* (L. Fargotstein (red); Sixth Edit). SAGE Publications, Inc.

Yusoff, A. M., & Sidhu, M. S. (2002). Paperless in the electronic era: Millennium dream and reality. *Proceedings of the International Conference on Computer Supported*

Cooperative Work in Design, 536–541. https://doi.org/10.1109/cscwd.2001.942319

Zauskova, A., Kusa, A., Kubovics, M., Scepkova, S., & Urminova, M. (2022). Current State and Prediction of the Future of Digitization As a Part of Industry 4.0. *Serbian Journal of Management*, *17*(1), 111–123. https://doi.org/10.5937/sjm17-36468

VIII. Annexes

Annex A - Iscte Organigram

Annex B - Informed Consent

Entrevista: Consentimento Informado

Caro/a participante,

No âmbito do Mestrado em Gestão de Empresas do ISCTE, convidamo-lo/a participar nesta entrevista.

O estudo foca-se sobre o sistema sem papel resultante da utilização de sistemas digitais (como software, base de dados, etc.). Em particular, estamos interessados na experiência de quem os utiliza, especificamente no ISCTE. A entrevista pretende apenas obter opiniões e perceções individuais, não existindo respostas certas ou erradas.

Não existe também nenhum risco inerente à sua participação neste estudo de investigação; a sua participação é totalmente voluntária, pode desistir em qualquer altura, sem precisar de prestar qualquer explicação. A entrevista realizada garante ainda a confidencialidade dos seus dados: não serão incluídos na tese dados que o identifiquem; os resultados do estudo estão disponíveis mediante pedido.

Declaro ter compreendido os objetivos de quanto me foi proposto e explicado pelo investigador, ter-me sido dada oportunidade de fazer todas as perguntas sobre o presente estudo e para todas elas ter obtido resposta esclarecedora, pelo que aceito a participação no estudo e a gravação da respetiva entrevista:

_____   (local),   _____/_____/_____   (data)

Nome:_____

Assinatura:_____

_____

Para qualquer dúvida ou esclarecimento contacte João Pedro Diamantino através de jpfdo@Iscte-iul.pt.

Muito obrigado pela sua participação!

Annex C - Interview Guide

1. Há quantos anos trabalha no ISCTE? 0-4 __ 5-9 _ 10-14__ 15-19 ___ 20-24 __ + 25__

2. Há quantos anos trabalha no departamento onde está atualmente? 0-4____ 5-10 ___ 10-15___ 15-20 ___ 20-24 _____ + 25_____

3. A utilização do sistema sem papel é cada vez mais uma tendência nas organizações. Verifica-se assim a substituição do papel por bases de dados e softwares, entre outros sistemas que permitem executar diversas tarefas sem recurso ao uso do papel. Vê esta aplicação no ISCTE? Consegue dar exemplos concretos da aplicação deste sistema no seu departamento em particular?

4. Como avalia a aplicação do sistema sem papel no seu departamento? Começando com as vantagens:

    4.1. Na sua opinião quais as principais vantagens deste novo processo?

E em termos do que não é tão positivo:

    4.2. Na sua opinião quais as principais desvantagens deste novo processo?

5. Geralmente, as mudanças para sistemas sem papel acontecem ao longo do tempo. Como avalia o processo de transição para este novo sistema no seu departamento?

6. A Pandemia vivida nos últimos 2 anos impactou este processo de transição para o sistema sem papel de alguma forma?

7. Sente que com a aplicação desta nova forma de trabalhar o seu dia a dia de trabalho mudou? Consegue dar exemplos concretos de como?

8. Como sente que foi a sua adaptação pessoal a este novo sistema?

9. Tem alguma sugestão de como o sistema sem papel no seu departamento poderia ser melhorado?

10. Quer acrescentar mais alguma informação que não tenha sido solicitada durante esta entrevista?