

**THE USEFULNESS OF THE RESOURCE-BASED VIEW IN
INFORMATION SYSTEMS RESEARCH**

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Abstract

Today's increasingly competitive and turbulent markets force organizations to rethink their business strategies, being a vital aspect to achieve sustainable performance and to stay competitive in such unpredictable environments. The Resource-Based View has been a prominent framework in strategic management for understanding how firms can attain competitive advantages, and with the increasing significance of technology and information as organizational resources, this project investigates the dynamic relationship between the RBV approach and the Information Systems field, seeking to uncover their mutual influences and contributions.

It begins by providing a comprehensive overview of the Resource-Based View theory, tracing its origins in the field of strategic management. It then delves into the Information Systems field, elucidating the pivotal role of technology, data, and Information in modern organizations. This research employs qualitative analyses to investigate how RBV principles are integrated into IS strategy and decision-making processes, that comprised data collection through interviews to professors and experts on the area to assess the practical applications of RBV within the IS context.

The findings of this study contribute to both the academic and practical realms, so as to help firms stay competitive leveraging their information and technology assets strategically, since these results are projected to be essential to scholars and researchers, as source of reference material to future research.

Keywords: Resource-Based View; Sustainable Competitive Advantage; RBV's usefulness within IS; Information Systems; Information resources

JEL codes: M10 – Business Administration: General; L20 – Firm objectives, organization, and behavior: General

Resumo

Os mercados cada vez mais competitivos e turbulentos da atualidade forçam organizações a repensar as suas estratégias de negócio, sendo um aspeto vital para alcançar um desempenho sustentável e se manterem competitivas em ambientes tão imprevisíveis. A Visão Baseada em Recursos (VBR) tem sido uma estrutura proeminente na gestão estratégica para compreender como as empresas podem obter vantagens competitivas, e com a crescente importância da tecnologia e da informação como recursos organizacionais, este projeto investiga a relação dinâmica entre a abordagem da VBR e o campo dos Sistemas de Informação, em busca de descobrir as suas mútuas influências e contribuições.

Esta investigação começa por fornecer uma visão abrangente da teoria da Visão Baseada em Recursos, rastreando as suas origens no campo da gestão estratégica. Em seguida, aprofunda-se no campo de Sistemas de Informação, elucidando o papel fundamental da tecnologia, dos dados e da informação nas organizações modernas. Esta pesquisa utiliza análises qualitativas para investigar como os princípios da VBR são integrados na estratégia de SI e nos processos de tomada de decisão, incluindo a coleta de dados por meio de entrevistas com professores e especialistas na área para avaliar as aplicações práticas da VBR no contexto de SI.

Os resultados deste estudo contribuem tanto para o campo académico quanto para o prático, a fim de auxiliar as empresas a se manterem competitivas alavancando estrategicamente seus ativos de informação e tecnologia, uma vez que esses resultados são projetados para serem essenciais para académicos e pesquisadores, como fonte de material de referência para pesquisas futuras.

Palavras-Chave: Visão Baseada em Recursos; Vantagem competitiva sustentável; utilidade da VBR no campo de SI; Sistemas de Informação; Recursos de Informação

Códigos JEL: M10 – Gestão de Empresas; L20 – Objetivos da empresa, organização e seu comportamento

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Chapter I – Introduction

1.1 Contextualization of the dissertation topic

In today's Information Age, and with the development of e-Businesses, we see technology transforming industry after industry, as well as creating new industries (Hidding, 2001). We see organizations facing the challenge of surviving in increasingly dynamic markets, where the competition is noticeable and inevitable. In this regard, Information Systems are becoming of ever greater interest in progressive and dynamic organizations, providing them with the information necessary to stay afloat, and serving as tools to allow these companies to be competitive in the markets where they operate.

With the ever-increasing pressures of globalization, companies struggle to maintain their competitive advantage. Furthermore, with the increasing connectivity associated with the advanced telecommunications technologies that are driving globalization, the economic barriers to entry that traditionally existed are no longer effective (Kenyon & Sen, 2015). Given these factors, organizations seek to continuously develop new products and innovate the already existing ones, since change is the only aspect that seems to be constant in markets nowadays.

Under this line of thought, the RBV of the firm is perhaps the most influential framework for understanding strategic management. However, it still lacks comprehension in a more technological context. The resource-based view (RBV) of the firm suggests that organizations compete and create value on the basis of resources that are unique, rare, valuable, and not easily imitable or substitutable (Tarafdar & Gordon, 2007). These resources encompass tangible and intangible assets, including a firm's management skills, its organizational processes and routines, and the information and knowledge it controls (Barney et al., 2001). At the same time, Information Systems have evolved from being operational tools, to becoming strategic assets that shape decision-making, assist in innovation, and enhance an organization's operations.

The theory provides a cogent framework to evaluate the strategic value of information systems resources (Wade & Hulland, 2004), and even plays a big part on how to differentiate among various types of information systems – including the important distinction between information technology and information systems – and how to study their separate influences on performance (Santhanam and Hartono, 2003; Wade & Hulland, 2004). Yet, it's not optimally fitting to be employed within an IS context, given that IS resources rarely contribute to a directly influence in achieving sustainable competitive advantage.

Therefore, the research and development of this thematic is relevant to understand how the strategic utilization of IS takes on a new significance within the context of RBV, to what extent it can be improved to assess Information Systems as sources for competitive advantages and to gain a better comprehension on the mechanisms through which IS can amplify a firm's resource-based advantages.

1.2 Objectives

The main goal of this dissertation is firstly to gain a better understanding on how RBV and Information Systems relate to each other and to contribute with an injection of fresh ideas that can serve as basis for extending the Resource-Based View theory in meaningful directions.

Having in mind that very little discussion has been conducted on the RBV, when it comes to the field of IS, the present dissertation has as its goal to explore and investigate different paths to gain a better comprehension on how IS can be applied to the RBV framework. For that reason, some other primary objectives arose.

We intend to examine the role IS plays in implementing and shaping a firm's resources and dynamic capabilities, in order to understand what type of resources and capabilities a firm needs to apply IS to its business, as well as explore how the strategic utilization of Information Systems enhances a firm's resource base and protection.

Upon this reasoning, the main purpose for this research is not to give a straight answer to the problem, but rather add relevant and consistent information to this thematic. These insights can be harnessed by organizations, or even researchers, all over the world when searching for an understanding on how to use Information Systems aligned with the RBV principles.

In lights of this, two additional primary objectives underscore the significance of this dissertation. It seeks to ascertain the role of Information Systems as sources for creating competitive advantages, and to examine the avenues through which IS can be classified as valuable, rare, inimitable, while simultaneously explore how the organizations should structure themselves to harness these advantages, as prescribed by the VRIO framework.

1.3 Consideration on the dissertation structure

In order to achieve the stated objectives, the composition of this dissertation is subdivided into seven chapters. This first one is referent to the introduction, where some theoretical background is exposed and elucidates the theoretical and empirical objectives that have driven the formulation of this study.

The second and third chapter illustrate the planned literature review, which is divided into two sections. The initial section (chapter II) delves into the Resource-Based View (RBV) approach. Here, its historical development is outlined along with some general ideas about the theory, such as some key concepts to understand what the theory is and what qualifies as a resource within this framework. Additionally, this chapter addresses existing research concerning the application of RBV within the context of IS. It primarily concentrates on the core thematic of the dissertation with a particular focus on how the established authors in this domain perceive the applicability of the RBV approach within the Information Systems field. The third chapter regards the IS domain. Similar to Chapter II, this section provides a definition of IS, highlights its advantages, and acknowledges potential difficulties of its usage. Furthermore, key conceptual aspects are presented when it comes to understanding what is meant by IS resources and IS capabilities.

Subsequently, in Chapter IV, the theoretical framework is established, along with the corresponding research questions. This framework will lay the foundation for driving the empirical segment of this investigation, facilitated by a comprehensive review of pertinent literature relevant to the thematic. Chapter V regards the employed methodology, providing details about the research model utilized and a description of the sample of the study.

In Chapter VI, the presentation and discussion of the results take center stage. In this section, the answers obtained from the interviewees for each research question are analyzed in detail, accompanied by a comparative analysis of these outcomes with the literature advocated by the studied authors, culminating in the primary conclusions of this dissertation.

Lastly, Chapter VII encompasses the final considerations of this scientific investigation and incorporates contributions to the domain of business strategy. Additionally, it addresses the study's constraints and provides suggestions for future research efforts.

Chapter II – Resource-Based View

2.1 What is the Resource-Based View?

The strategic management field is organized around one main research question: *Why do some firms persistently outperform others?* This question implies that persistent performance differences existent between firms cannot be analyzed nor explained by traditional economic theories of performance. The Resource-Based View (RBV) ideology mostly reinforces that strategic human resource management (SHRM) principle, which shows that the variety of resources in an organization, including the human resources (HR), creates an organization's distinctive nature and this builds a competitive advantage (Assensoh-Kodua, 2019).

Even though prior works have identified organizational resources as important to firm's success (Penrose, 1959), it was not until the 1980s that the resource-based view of the firm began to take shape. At that time, the dominant paradigm held that industry-level factors determined each firm's profit potential (Porter, 1979). Later researchers started to argue that factors internal to the firm, namely, its resources and capabilities, really determined its profits Wernerfelt (1984); Kozlenkova et al. (2014). Nowadays, there are two conceptual variations of this model of the resource management. The first is the traditional or structural version, which comes from the fact that firms operate on markets with predictable behavior parameters. The combination of resources is not set by the firm but is dictated by processes occurring on market (Balashova & Gromova, 2016). The second one is the dynamic or process version, according to which internal processes have an impact on the formation of the resource combinations.

The RBV has become one of the most influential and cited theories in the history of management theorizing. It aspires to explain the internal sources of a firm's sustained competitive advantage (SCA). According to Kraaijenbrink et al. (2010), its central proposition is that if a firm is to achieve a state of SCA, it must acquire and control valuable, rare, inimitable, and nonsubstitutable (VRIN) resources and capabilities, plus have the organization (O) in place that can absorb and apply them. By analyzing firms from the resource side rather than from the product side, we can say that the RBV rather takes an introspective stance on why organizations succeed or fail (Wernerfelt, 1984). In seeking to explain the degree to which an organization

may be able to sustain a competitive advantage, the theory takes the resources hold by the firms as the unit of analysis (Lockett, Thompson, and Morgenstern, 2009).

Following Barney quoted by (Patas et al., 2012), every firm owns a bundle of individual resources which account for the condition to engage in competitive environments, successfully. In this context, two assumptions are fundamental to the RBV. First, resources are distributed heterogeneously across firms, which consequently results in competing firms owning different bundles of resources. Second, resources are immobile, which means these productive resources cannot be transferred from firm to firm costless, so that heterogeneity can be long-lasting. Nevertheless, not all resources contribute to the generation of competitive advantages. The Barney value-rarity-imitability-organization (VRIO) framework assesses the resources and capabilities of organizations and the resulting potential for competitive advantage based on the following four criteria: value, rarity, imitability, and exploitation by the organization as shown in the table below:

Is a resource or capability ...				
Valuable?	Yes	Yes	Yes	No
Rare?	Yes	Yes	No	-
Costly to imitate?	Yes	No	-	-
Exploited by organization?	Yes	←	→	No
Competitive implications	Sustained advantage	Temporary advantage	Parity	Disadvantage
Economic performance	Above normal	Above normal	Normal	Below normal

Table 1- Barney and Clark's VRIO Framework

Source: (Barney & Clark, 2007); Miethlich & Oldenburg (2019)

Valuable (V) resources play an important role regarding the firm's efficiency and effectiveness since they neutralize threats in competitive environments and enable the organization's ability to exploit opportunities. Rarity (R) refers to the condition where the resource is not simultaneously available to a large number of firms (Amit and Schoemaker, 1993, quoted by (Kraaijenbrink et al., 2010), being limited in terms of supply and unbalanced regarding the

distribution along the firm's current and potential competition. To put it in perspective, Coca-Cola is a well-known brand, making it valuable, but most of Coca-Cola's competitors (Pepsi, 7Up, etc.) also have widely recognized names, making it not that rare. It is also worth noting that, when such resources are simultaneously not imitable and not substitutable, those resources may become sources of competitive advantages that are sustainable (Barney et al., 2001). Imperfectly imitability (I) refers to those resources, or combination of resources, that the competitor cannot possess, meaning that making copies or imitating these resources will not be achievable. Factors for inimitability can be many, such as difficult resource acquisition, resource complexity, or even the ambiguous relationship between capability and competitive advantage. Non-Substitutability (N) of resources implies that a resource can't be replaced by another alternative one to perform as efficiently or effectively as the original one, making it difficult for competitors to achieve the same performance using alternative resources. The resources themselves do not confer any advantage for a company if it's not organized (O) to capture the value from them. A firm must have its management systems, processes, policies, etc., to be able to fully attain the potential of its valuable, rare, and costly to imitate resources and capabilities.

These types of resources are called VRIN resources – valuable, rare, inimitable, and non-substitutable and they are more likely to become the sources of sustainable competitive advantage (Barney et al., 2001). Thanks to the creation of this framework, RBV has gained momentum in the strategy research where a firm must acquire and control valuable, rare, inimitable, and non-substitutable (VRIN) resources and capabilities possessed by an organization (VRIO) (Mathews, 2019).

2.2 Types of Resources

According to RBV, resources can be broadly defined to include assets, organization processes, firm attributes, information, or knowledge controlled by the firm which can be used to conceive of and implement their strategies (McIvor & McKittrick, 2009). This theory also asserts that ownership and control of strategic assets determines which organizations will attain competitive advantages over others, earning superior profits. One of the main insights cropping up from the RBV standpoint is that not all resources in an organization have the propensity to offer a tremendous sustainable upper edge or are of equal essence. It is also essential to understand that

sustaining a competitive benefit solely relies on how efficient are substituted or imitated (Assensoh-Kodua, 2019).

Resources and capabilities are central constructs in RBV. Therefore, it is important to understand the difference between these constructs and distinguish them from dynamic capabilities, which have entered RBV research more recently. Resources refer to tangible and intangible assets that firms use to conceive of and implement strategies (Barney & Arikan, 2001). Capabilities are subsets of firm's resources, which represent an organizationally embedded non-transferable firm-specific resource whose purpose is to improve the productivity of the other resources possessed by the firm (Kozlenkova et al., 2014).

All firms possess a wide range of resources, and in order to understand them it was used an approach that classifies the resources in two distinct categories, tangible, and intangible resources. Tangible resources are resources that can be readily seen, touched (Osakwe et al., 2022), or even quantified, also considered as physical assets, and may include the machines, the firm's property, the equipment, the cash per se, and so on. From a more financial point a view, it may include the firm's financial capital like debt capital or retained earnings and may also be organizational or technological. Whereas intangible resources are those that, by definition, do not have a physical presence, and may include brand presence, the knowledge and skills of the firm's employees, the organization's culture, which according to Barney & Arikan (2001); Osakwe et al. (2022), are as much important as all the others.

Usually, resources are considered valuable when by using them firms can design and implement various strategies, that ultimately reduce their net costs (low-cost resources) and consequently increment their net revenues (differentiated resources). We can also assess the value of resources in regards with their ability to allow firms to develop and implement strategies that fit the market within which the firm operates (Barney, 1991). In essence, a resource is valuable if it helps the organization in the improvement of its performance relative to its competitors. If the resource doesn't meet these conditions (reducing net cost, incrementing net revenue), and is exploited, in the worst-case scenario, a competitive disadvantage may be gained (resource not valuable to the firm).

Regarding the issue of heterogeneity, a resource can only be a source of competitive advantage if it isn't freely available to all firms, meaning that it's heterogeneously distributed. If not, it is only possible to attain a competitive parity from the given resource. Resource impact is also measured through questioning the mobility or inimitability of a resource. If it isn't imperfectly mobile, then it can only guarantee a temporary competitive advantage. This temporary nature stems from the fact that, due to the mobility of the resource, it is possible that it can change hands, also providing temporary advantages to other firms.

According to Barney (1997), there is also something called 'Schumpeterian Shocks', which basically are unanticipated changes in the economic structure of an industry. These changes challenge firms sustained competitive advantages, resulting in major shifts in the nature of competition and any sources that could be considered to achieve sustained competitive advantage are later questioned if they're still able to sustain CA and may be nullified. Therefore, a sustained competitive advantage may only be made when resources are indeed valuable and strategic, are not freely available to all firms and are imperfectly mobile, considering that firms don't go through periods of Schumpeterian Shocks (Madhani, 2010).

There's still a misconception about possessing a large portfolio of resources. In most cases, it's not the leveraging of a single resource that can achieve a sustainable competitive advantage, since it's not capable to enable a firm to develop and implement an efficient strategy, but rather the synergistic combination and integration as well as the bundling of resources leads to a sustainable competitive advantage (Miethlich & Oldenburg, 2019). Being able to mix certain resources with each other, not knowing what the reaction might be, since it's hard to understand how different resources interact, can also be an advantage. It makes it harder for competitors to realize how firms can keep a superior performance, preventing the imitability of such valuable interlacement of resources. However, bundles of resources do not guarantee a sustainable competitive advantage. If other firms possess the same resources and employ them in a similar way to implement or develop similar, or even, the same business plans, then these bundles of resources no longer assure a competitive advantage to the firm. For that reason, despite being necessary, bundles of resources are not a sufficient requirement to provide the firm with a superior performance.

2.3 RBV for Information Systems research

As aforementioned, and following Barney, Grant (1991), Penrose (1959) and Wernerfelt (1984), Wade & Hulland (2004), the resource-based view argues that firms own resources, and by combining them, enable the possibility to attain competitive advantage, and furthermore, a superior long-term performance. It's a theory that focuses on explaining how resources can influence the firm's attempt to achieve superior performance relative to its competitors. However, researchers still have a hard time in defining what is meant by a resource. They've used a variety of designations and terms when talking about firm's resources like, competencies, strategic assets, sets of skills, etc. Which leaves the question: 'So, what exactly is a resource?'. Well, there's no right answer, constituting one of the main problems for research using the RBV, since there's this polysemy of definitions and classifications.

IS researchers are increasingly using the RBV for their studies, since the theory has proven to be very helpful and influential in other management fields like marketing or strategy, so it makes sense to reflect and evaluate the usefulness of this theory for the IS field. As currently envisioned, the RBV is not the preferred theory to study information systems since resources such as brand equity or the machinery are capable of directly guaranteeing a sustainable competitive advantage. Whereas, and according to the definition of (Wade & Hulland, 2004), IS resources form a part of a complex network of tangible and intangible IT capabilities and IT assets, that combined can lead to sustained performance. For example, software and hardware can be considered as IT assets serving a purpose in a transformation process. As all resources in strategic management, in order to fulfill the firms' ambitions and create competitive advantage, they need to obey the VRIO framework (includes value, rarity, imitability, organization). Regarding IT resources, Wade and Hulland (2004) added the attribute appropriability that complemented with the rest of the attributes, can attain sustained competitive advantage.

Resources are stocks of available factors that are owned or controlled by the firm (Amit and Schoemaker, 1993, quoted by (Tarafdar & Gordon, 2007)). They can be tangible assets, such as plant technology, capital equipment, facilities, and raw materials (Itami, 1987). They can also be intangible assets, such as skills, judgment, insight, and experiences of individual employees, brand names, and patents (Barney, 1991; Grant, 1991). Having in mind that resources can be

internal or external to the firm, it suggests that information systems can be considered as internal firm resources since its usage and integration are under the firm's full control, be it in the form of access, progressive ownership, or even total ownership.

Generally, information systems, as an internal firm resource, are considered to be more powerful than an external firm resource in establishing competitive advantage (Gupta et al., 2018). This can be considered, especially if we reflect on the benefits that come from having an information advantage as, and according to Lubit (2001), Porter and Millar (1985), it facilitates the creation of other competitive advantages, such as cost and differentiation advantages. Also, it allows firms to detect and respond to market opportunities and threats, such as to counter and protect against resource imitation, transfer, or substitution (Wade & Hulland, 2004). This way, it was possible to apply the RBV to Information Systems literature, classifying an organization's IS-related resources into three broad categories: technical, human, and intangible, or as Powell and Dent-Micallef (1997) decided to classify it: human resources, business resources, and technology resources. The use of technological resources aims to help in the formation of a platform where information systems are built, and consequently can process, transfer, store and retrieve information more easily. According to Armstrong and Sambamurthy (1999) these resources include physical IT assets such as hardware, software, databases, applications, and networks. As for human resources, it includes qualified IT professionals, who understand the technical and innovative skills to which this area subjects them. Intangible IS resources include knowledge assets, a customer orientation, a flexible IS culture (Bharadwaj, 2000), and partnerships between IT and business units (Bassellier and Benbasat, 2004).

A study conducted by the U.S. retail industry discovered that only human resources in accordance with IT could provide improved performance. In contrast, no technology resources showed a positive linkage with performance, and only IT training had a positive impact on performance regarding business resources. Because of this, Marchand et al. (2000) proposed an information orientation construct comprised of three elements: information technology practices, information management practices, and information behaviors and values, which ended up being validated using data from a large-scale cross-sectional survey, and even

managed to notice that companies that rank highly on all three information attributes, tend to have superior performance (Wade & Hulland, 2004).

The increase in the use of state-of-the-art technologies has become a factor to consider, as it can undermine the sustainability of existing competitive advantages held by the firms. This may be seen especially in firms that are innovative but not agile enough to detect and respond to change, and therefore they fail to build and sustain a rich and dynamic portfolio of competitive advantages (McGrath, 2013, quoted by (Gupta et al., 2018). This situation provoked a perception in the companies that operate in the current competitive environment that change is the only constant, so they should focus more attention on bringing innovations in information systems, that can be a tool to achieve a portfolio of transient competitive advantages, instead of the traditional sustainable competitive advantages. This way, firms that are information-intensive will work towards developing and growing their information systems in the short and long-runs.

Chapter III - Information Systems

These days, most enterprises heavily rely on Information Systems (IS) to assist in their business, making them the backbone of most modern organizations (Soares et al., 2017). The academic field of Information Systems is concerned with a large range of multifaceted questions regarding the development, use and implications of information and communication technologies in organizations (Avgerou, 2000). According to Díez & McIntosh (2009) IS have acquired a central role in modern society, especially in this digital oriented economy, as they can be tools for the recording, storing, processing, and dissemination of information, as well as helping in the reduction of costs and boosting the productivity. The interest on the potential of Information Technology (IT) stems from the increasing role it has been playing in the strategic thinking of organizations and its effect on firm performance.

Despite the benefits that IS bring to organizations, there's still a misconception of its definition in literature, in the sense that there's a lack of agreement regarding the meaning of the term. This ambiguity is not related with the lack of information or studies, but rather, because of the way it is applied and interpreted by researchers. The same meaning can have

different terminologies and designations depending on the context. According to Falkenberg (1998) it is difficult to define a single unified vocabulary for the whole domain of information systems, since there are many different subdomains concerned with different sets of problems.

Other problems arise when considering the usage of Information Systems, a study performed by the Standish Group (an American Consultancy specializing in IT research), quoted by Díez and McIntosh (2009), found that only 26% of all Management Information Systems (MIS) projects are completed on time and within budget. As per McIntosh *et al.* (2005, quoted by Díez & McIntosh, 2009) a similar situation has been reported for environmental applications, where concerns have been raised about a lack of fit between IS, like simulation models and the need of policy, and planning processes, making it difficult to determine the benefits that come from the usage of Information Systems. In order to achieve a better understanding on the ways in which information is acquired, manipulated, and managed by organizations, the usefulness of IS should be discussed first, since it can be a fundamental influence in the development of Information Systems.

According to Ragowsky *et al.* (1996) firms differ in the benefits they gain from similar IS applications, which indicates that the main problem is how to relate the benefit a specific organization can derive from an individual IS application to the organization's characteristics. By applying Information Systems in their business, organizations are able to gather and use more information for decision making, mainly when there are several appealing alternatives, having the ability to run different scenarios through the calculation of key indicators like costs, sales, or profits, determining the alternative with the most beneficial results. However, the quality of information is also something that should be considered, since it is the pinnacle to make the best decisions regarding a firm's business. For example, if collected data is of poor quality, then the firm is mostly guessing at what customers want, or even worse, they might be actively moving towards the wrong direction by doing things customers' dislike. This way, the quality of information can be measured considering five characteristics: accuracy - regards the precision of the information and if it's correct, completeness - refers to how comprehensive the information is and is directly related with the accessibility of all details of the information, reliability – to ensure there's no contradictions between sources, uniqueness – information must be unique and distinctive in order to add value to any organization, and timeliness – in this era

of high technological advances, out-of-date information can keep a company from achieving their goals or from surviving in competitive environments.

As per Redman (1998); Gorla et al. (2010), poor data quality, and hence poor information quality, has adverse effects on organizations at operational, tactical, and strategic levels. At the operational level (the last level of responsibility in an organization), which is responsible for the short-run decisions since the information required isn't as elaborate and as complex as in other levels, inaccurate or incomplete information can result in customer dissatisfaction or lack of enjoyment by the employees. At the tactical level (intermediate level), where information is used for medium-term decisions, irrelevant information can adversely affect the quality of decision-making. Whereas at the strategic level (the first level), where information usually is of high-quality and elaborate, inaccurate or delayed information can hinder long-term decisions. In contrast, high information quality can lead to increased efficiency and have a high organizational impact regarding market information. Information quality is positively associated with organizational impact (Gorla et al., 2010).

3.1 Advantages of using Information Systems resources

According to Laakso-Manninen & Viitala (2007), quoted by (Memon et al., 2022), competence analysis, development discussions, strategic orientation, training, or recruiting processes become handier when the information is stored electronically in one place. These days, especially in hyper-competitive environments, knowledge has become a must-have asset for organizations, since it is a critical source for attaining a sustainable competitive advantage, if applied correctly. It's also worth noting that in this type of environments, knowledge management is a necessity and companies should concentrate in implementing its information systems if they want to have any sort of advantage relative to its competitors, as "modern organizations are increasingly seen as knowledge-based enterprises in which proactive knowledge management is important for competitiveness" as per Holsapple et al. (2000, quoted by Hemmatfar et al., 2010).

There has been a growing realization in making Information Systems of strategic importance to organizations. As per Turban et al. (2006, quoted by Hemmatfar et al., 2010), an SIS is

characterized by its ability to significantly change the manner in which business is conducted, in order to give the firm strategic advantage. It is typically used to streamline and speed up the reaction time to market and environmental changes, following a few key features: (1) decision support systems, used to align IS or IT with an organization's business strategies; (2) enterprise resource planning, used for the optimization of the firm resources through the managing and monitoring of business ongoing processes; (3) database systems, used for improvements in other departments through the available corporate information contained in them; (4) real-time IS, used for the maintenance of a rapid-response and the quality indicators.

When IS was first conceived, its main objective was to automate manual and pre-computer mechanical processes. Nowadays, they've significantly matured and have assumed important roles and functions in an organization. Following (Vartiainen & Hansen, 2009), IS have been extended to support business strategies, business processes, and organizational structures and cultures of an enterprise. It is well known that even the simplest use of technology can dramatically improve a firm's business productivity and efficiency, having all types of impacts in an organization for example: they can produce custom data to help with a specific task or decision-making, can produce real-time data, which is particularly useful when a fast action is needed, or even archive data, specially used for reports, analysis, or business planning. In this context, it makes sense that an adequate utilization of Information Systems is of high importance, even more in organizations as they're considered transversal to the firm and to several business sectors, like for example an ERP (Enterprise Resource Planning).

ERP is capable of having the entire organization under its control by monitoring materials, orders, schedules, finished inventory goods, and other key information that are important to the management (Zare Mehrjerdi, 2010). With this, IS allows firms to have up-to-date and real information on a wide range of aspects in organizations' management, allowing at the same time a better management of the firm. Basically, and following (Vadivalu, 2021), it is a general working platform for all departments of the enterprise provided in a computer program with management functions of all departments. The implementation of ERP provides organizations with a bundle of benefits like quicker, accurate and reliable access to information, as also speeding up the decision-making time since data is of easy access and it's at their "fingertips". There are also other advantages in implementing an ERP, like having a centralized data system

(DS) as it gives visibility to reports at any given time, improving efficiency by reducing manual operation.

There is indeed a widespread awareness of a wide range of advantages in the usage of Information Systems. For example, and following (Mendes & Filho, 2002), it is possible to verify that implementing an ERP can bring various advantages like obtaining information in real time, process documentation optimization, cost reduction in the IT area, improvements in efficiency, among many others. However, and as explained before, there are other ways to look at what the Information Systems area can bring to organizations. Another perspective is presented for example by the researchers Kenneth E. Murphy and S. J. Simon, who divided the advantages that come from an ERP by categories, namely operational, managerial, strategic, IT infrastructure and organizational. In the table 1 below is presented the advantages that come from an ERP, divided by categories:

Dimensions	Subdimensions	Tangible?	Quantifiable?
1. Operational	1.1 Cost reduction	Full	Full
	1.2 Cycle time reduction	Most	Full
	1.3 Productivity improvement	Most	Full
	1.4 Quality improvement	Some	Most
	1.5 Customer services improvement	Some	Most
2. Managerial	2.1 Better resource management	Some	Most
	2.2 Improved decision-making and planning	Some	Some
	2.3 Performance improvement	Most	Most
3. Strategic	3.1 Support business growth	Some	Full
	3.2 Support business alliance	Low	Most
	3.3 Build business innovations	Some	Some
	3.4 Build cost leadership	Some	Some
	3.5 Generate product differentiation	Some	Low
	3.6 Build external linkages	Low	Some
4. IT Infrastructure	4.1 Build business flexibility for current and future changes	Low	Low
	4.2 IT costs reduction	Full	Full
	4.3 Increased IT infrastructure capability	Some	Some
5. Organizational	5.1 Support organizational changes	Low	Low
	5.2 Facilitate business learning	Low	Low
	5.3 Empowerment	Low	Low
	5.4 Build common visions	Low	Low

Table 2 - Murphy & Simon (2002) Perspective on ERP Advantages

Source: Murphy & Simon (2002)

3.2 Difficulties and disadvantages in adopting Information Systems

According to Stewart & Mohamed (2003); Ebrahimi et al. (2013), despite of its benefits, a sense of dissatisfaction has been created about investment on IT some of which was because of limitations in defining measurement criteria for the value added to the organization by IT. The adoption and implementation of IS is effectively a critical phase, especially if we consider the number of resources that are needed, as well as the commitment and changes that happen in the organization, being that the implementation of, for example an ERP, might be the single major project that a firm can execute.

Computerization projects used to have more or less clear efficiency objectives and were not intended to cause significant organizational changes. However, the assessment of the costs and benefits of information systems are much more complex than what investment appraisal techniques could account for, as they're not as easily or legitimately quantifiable in monetary terms. According to Souza & Zwicker (2000, quoted by Mendes & Filho, 2002) the main difficulties are referred to the constant updating of the system and the versions management, whereas Stamford (2000) believes that the main problems come from process reengineering, tasks of customization during deployment, the inexperience of the support team, the lengthy deployment, the high costs related to consulting and training, to the complexity in customization and the benefits that don't always are attained. Despite these beliefs regarding the difficulties in implementing an ERP, the problem that is most common in organizations is the resistance of some employees to change and the inability to understand the expected benefits. ERP implementation cannot be seen as a technology change, but rather as a process of organizational change (Mendes & Filho, 2002).

After implementation, proper use of ERP systems can further increase the competitiveness of an organization, reason why during this process, and according to Gable (2003, quoted by Zare Mehrjerdi, 2010), consultants bring to the organization specialized skills, experience, and know-how that the organization needs when it is both time-consuming and expensive for it to build internally. Naturally, it can't only bring advantages, being an ERP associated with a number of risks for the organization, regardless of the industry where it is inserted. There's a possibility that the selected ERP software is not a good fit for the business requirements, it brings a high turnover rate for team members, since sometimes there's big amounts of workload and stress, similar to the situation lived in Twitter HQ nowadays, thanks to short deadlines or

tight schedules, the involvement of top management, the continuous adaption and redefinition of the processes, regular system actualizations, among others.

3.3 IS Resources and IS Capabilities

As previously said, and rooted in management strategy literature, the RBV theory argues that unique resources are the main sources of competitive advantage and organizational performance (Gu & Jung, 2013). There's still ambiguity regarding the definition of resources and capabilities. Some researchers consider that capabilities should be included when talking about resources, as for others, like Amit & Schoemaker (quoted by Gu & Jung, 2013), resources and capabilities should be distinguished.

Regarding IS capabilities, the IS literature on RBV has viewed it as a complex and multidimensional construct. Many researchers have their own view on what IS capabilities are, for example, and quoted by Gu & Jung (2013), Ross et al. (1996) viewed IS capabilities as abilities to perform strategically aligned planning, fast-delivery, and cost-effective operation and support, as for Ravichandran & Lertwongsatien (2005) IS capabilities are the routines within the IS department that enable it to deliver IT services to the organization, defining them as four constructs: IS planning sophistication, systems development capability, IS support maturity and IS operations capability. The importance of having strong IS functional capabilities stems from the fact that organizations might find it difficult to sustain or even initiate innovative projects targeted at enhancing the firms' core competencies, or in providing reliable IS services, if they're considered as weak.

When talking about IS resources, researchers in the IS field have identified several that may be potential sources of competitive advantage and performance. Mata et al. (1995, quoted by Gu & Jung, 2013), identified four attributes as resources: access to capital, proprietary technology, technical skills, and managerial skills. Ravichandran & Lertwongsatien (2005) identified three broad categories of resources in the IS literature: human capital (technical and business skills, and firm-specific knowledge), technological (infrastructure sophistication), and relationship

resources, and posits that each of these resources has a direct positive relationship with IS functional capabilities. This is consistent with what was argued by Teece et al. (1997), quoted by (Ravichandran & Lertwongsatien, 2005) that while “the essence of competencies and capabilities are embedded in organizational processes of one kind or another the content of these processes and the opportunities they afford for developing competitive advantage are shaped by the assets the firm possesses and by the evolutionary path it has adopted. Hence organizational processes are shaped by a firm’s asset positions”.

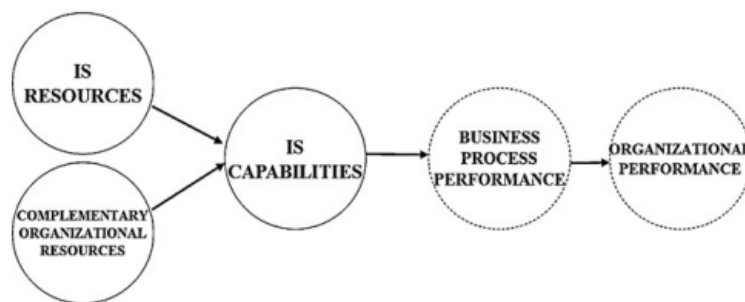


Figure 1 – IS Success Model and Performance

Source: Gu & Jung (2013)

Regarding the categorization of Ravichandran & Lertwongsatien, IS human capital plays a great role in the development of IS capabilities in organizations (Osakwe et al., 2022), with emphasis on two key indicators - skills and specificity. Skills pertain to the extent to which IS personnel have the required technical and business skills, whereas specificity is the extent to which an IS employee has firm-specific knowledge, meaning it has a good understanding of the organization’s culture and routines. Regarding infrastructure sophistication – set of shared technology resources that provides organizations with a foundation to enable present and future business applications, especially considering one important element – flexibility, it’s understood that it “enhances the firm’s ability to deliver technical solutions quickly and more effectively” (Ravichandran & Lertwongsatien, 2005). Moreover, it allows easy integration of new technologies with existing platforms, resulting in the allowance of the IS unit to deliver cutting-edge technology capabilities quickly and cost effectively. It’s even worth noting, when taking about the relationship resources, that the relationship that an IS unit has with vendors and service providers can be an important determinant of its functional capabilities, since if

considered a good relationship, it can be expected to tap into external resources better than those that do not have effective external partnerships.

The need to obtain access conveniently, quickly, and economically makes it imperative to devise procedures for the creation, management, and utilization of databases in organizations. Management information and information systems, in particular those related to effective decision-making processes in an organization, i.e., MIS, are regarded as valuable organizational resources (Adeoti-Adekeye, 1997). Consistent with this, and as previously said, the RBV is useful in the IS context because it provides a robust framework for analyzing whether and how IS may be associated with competitive advantage and performance Melville et al. (2004), quoted by (Gu & Jung, 2013). The way firms leverage their investments in order to create unique and valuable IS resources determines firms' effectiveness. However, researchers still have argued that investments alone are not sufficient to sustain competitive advantages, since they're easily duplicated by competitors. Still, and according to study performed by (Gu & Jung, 2013), by inserting IS capabilities and business process performance as variables when studying the relationship between IS resources and organizational performance, since the initial RBV was incapable of explaining it, they were able to conclude that: (1) there is a positive relationship between IS resources and IS capabilities, (2) there is a positive relationship between complementary organizational resources and IS capabilities, and (3) there is a positive relationship between business process performance and organizational performance.

With regard to the relationship between performance and IS capabilities, they've examined it from the project to the organizational level. Studies adopting the RBV theory discovered a dependency on IS capabilities, when considering business process performance, and that there's notorious improvements in project performance in the software industry, the higher the IS capabilities. According to Gibson et al. (2006); Gu & Jung (2013), Capability Maturity Model Integration (CMMI) empirical studies also reported that organizations have achieved higher productivity, cost performance, schedule performance, and business process performance through CMMI-based process improvements, so it's safe to say that IS resources and IS capabilities have measurable impact on the organization's performance.

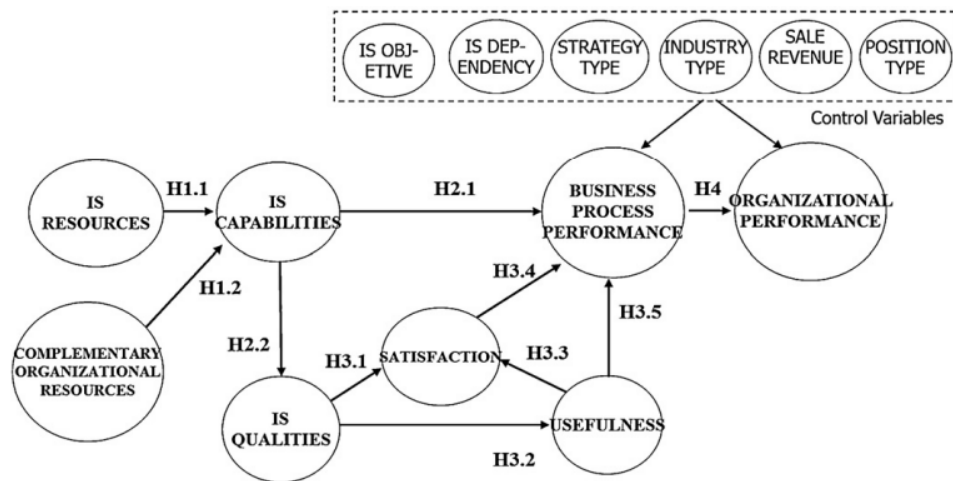


Figure 2 - Gu & Jung (2013) Integrated Research Model

Source: Gu & Jung (2013)

Chapter IV – Theoretical Approach

After our literature research on the Resource-Based View theory and Information Systems, there were several points of view presented by the studied authors regarding the usefulness of this theory when talking about Information Systems. As a result, some research questions arose, which will be addressed in detail in this chapter with the intent to help in the understanding of what type of resources does a firm need to have in order to implement IS, and how Information Systems themselves can be considered as resources.

The fact that we have entered turbulent times has been a central theme in the recent strategy literature. In these complex, competitive environments, firms have been forced to adapt and seek new ways of staying competitive relative to their competitors, in order to survive and to maintain their financial performance. In that regard, competitive advantages are the life blood of every company, and without a competitive advantage to differentiate it from its competitors, the company will eventually go out of business (Kenyon & Sen, 2015). We're experiencing hypercompetitive environments, characterized by high-velocity and a high level of rivalry, and even though the exact origin of such business environments is unclear, many authors agree that recent phenomenon such as globalization, technology dissemination, regulation, disintegration, and demand rarefication could be one of the causes of such accelerated disruptive and unstable business environments (Howard & Lapersonne, 2013).

Being present in such competitive markets, it's important for firms to possess high information advantages, which they can use to innovate their products, business processes, or even organic changes that create wealth. As currently conceptualized, RBV theory is not ideally suited to studying information systems (Wade & Hulland, 2004). However, its main argument is that firms own resources and by complementing them, can attain competitive advantages. The development of a competitive advantage means that the organization possesses resources and capabilities that are superior to that of its competitors, thus enabling it to deliver superior value to customers (Porter, 2004); (Chatzoglou & Chatzoudes, 2018). So, it makes sense to think about Information Systems as an internal resource for companies, since by providing the firm with up-to-date information, it can make it more flexible to market changes, protecting them in periods of instability and improve the detection of new opportunities, and exploitation of the

existing ones. A competitive advantage may derive from the flexibility of an organization and its capacity to react successfully to change (Chatzoglou & Chatzoudes, 2018), which brings us to the first research question of this investigation:

Q1 - What's the importance of the relationship between the Resource-Based View and the Information Systems field? Is the theory useful for the study of Information Systems?

Another interesting point suggested by the study of Wade & Hulland (2004) is the fact that IS resources can potentially create competitive advantages for firms, as a so-called first-mover advantage, concluding that many of the success stories attributed to new IT configurations were only successful for a short period of time. Furthermore, the authors also pointed out that outside-in resources (external relationship management; market responsiveness) and spanning resources (IS-business partnerships; IS planning and change management) tend to have similar resource attributes, and in general when compared to inside-out resources (IS infrastructure, IS technical skills, IS development, cost effective IS operations), tend to have somewhat greater value, be rarer (but less appropriable), be more difficult to imitate or acquire through trade, and have fewer strategic substitutes, and thus support a sustainable competitive position for a longer period of time. Although various studies have examined how IS resources can potentially create competitive advantages, very little work has been done regarding the sustainability of those advantages over time, leading to the second research question:

Q2 – Do Information Systems have the capacity to guarantee sustainable competitive advantages?

Today's increasingly changing environment makes the emergence of IT-enabled knowledge management capability (KMC) as a core competency for organizations to enhance individual performance, innovation, organizational capabilities, and competitive advantage (Gold, Malhotra, & Segars, 2001; Joshi, Chi, Datta, & Han, 2010; Ko & Dennis, 2011; Tseng, 2014). KMC can be defined as the process-based ability of the organization to mobilize and deploy knowledge-based resources to gain competitive advantages (Mao et al., 2016). RBV is particularly relevant in explaining the effects of IT resources on KMC. However, valuable IT resources alone, as proposed in the traditional RBV, are insufficient for agile business

processes, and IT resources cannot create value in a vacuum (Chen et al., 2014; Mao et al., 2016). Given that IS has become more homogeneous and ubiquitous, imitating IS capabilities for competitors has become easier, which opens the door for the understanding of how IS contributes to superior performance and, naturally, drives to competitive advantages.

Regarding the KMC, the authors also emphasize that the processes by which new knowledge is developed, fill the gap between IS competency and organizational performance, acting as a mediator of the relationships between ITI (IT resource that concerns the technology), ITH (IT resource that concerns the technical and managerial IS skills of the employees) and ITR (IT resource that refers to the relationship between IT and business units), and competitive advantages. In this regard, I intend, with the third research question, to discover how a firm can exploit the information systems in the best way possible:

Q3 - What type of resources and capabilities does a firm need to possess in order to be capable of, not only to implement, but also to take advantage of Information Systems?

Another interesting aspect of what Information Systems can do for companies is that IT and IS together provide new opportunities to businesses to redesign their business processes and work practices, while enabling organizational change. However, and according to Aydiner et al. (2019), IT/IS projects overrun their budgets by 45 percent, exceed their allotted time by 7 percent and provide 56 percent less value than predicted. Moreover, 17 percent of IT/IS projects are managed so poorly that they may jeopardize the existence of the company (Bloch et al., 2012). Previous studies show that the role of IT changes according to the industry where it is inserted, becoming in fact a differentiating factor in environments where IT is fundamental for either business changes or industry processes. Consequently, it creates the wrong perceptions regarding the possible ways in which IT/IS capabilities can impact on firm performance. IS are not concerned with IT only, but also deal with business systems, processes, and people to manage the information effectively, which according to (Devaraj and Kohli, 2003);(Aydiner et al., 2019), the actual usage of such systems is important, and it is the missing link between IT/IS and firm performance.

IS infrastructure, IS human resources, and IS administration are defined as main IS resources, and if a firm has the ability to exploit these resources, a capability can be built up on a certain function. IS capabilities are key indicators of a firm's capacity to implement and utilize IT systems effectively, thus rigorous IS capabilities are likely to produce value in an organization by quickly responding to changes in the business environment (Peppard and Ward, 2004; Wang et al., 2015; Aydiner et al., 2019). This heterogeneously distributed, immobile resources and capabilities are considered as the sources of the performance differences among the competing firms according to RBV (Barney, 2001), so it is pertinent to study and understand how RBV can be applied when talking about the impact of different IT/IS capabilities on firm performance, bringing us to the fourth question:

Q4 – To what extent can current Information Systems create value, rarity, difficult imitability? How should the organization structure itself to benefit from them?

As the usage of Information Systems continues to increase significantly, along with its numerous advantages, certain challenges and issues have also emerged, as the amplified and continuous utilization of the internet and wireless networks jeopardize the information security systems. Previous studies even highlight that the security risk is significantly expanding as a result of internal as well as external threats (Alkahtami & Norah, 2019). The authors state that, because of the increased dependency on Information Systems, it's imperative for organizations to improve its protective measures for security management, as the recognition of the effective use of various technologies, policies and actions are essential for not only securing the data, but also sustaining its effective management and development. Which leads us to the fifth and last question of this investigation:

Q5 – In what ways can Information Systems assist an organization in both safeguarding and developing its resources?

Chapter V – Methodology

This next chapter regards the research methodology that will be used in this study in order to show all the aspects that guided the decisions related to the method of this investigation.

5.1 Research Model

Research is a methodical, well-defined investigation of a certain topic with the goal of clarifying issues and generating new information that has broad applicability (Kapoor, 2022). It aims to explain and examine methods, pitch light on their restrictions and resources, elucidate their confines and property, clarify their presuppositions and consequences, linking their potentialities to the sunset zone at the “frontiers of information” (Dr. Swarooprani. K, 2022). In this regard, and according to the research classification criteria proposed by Vilelas (2009), there are two types of investigation: exploratory and descriptive. This first one seeks to obtain more and better knowledge, while opening the door to further research, whereas the second type of study has as their main objective, the description of reality about how a certain phenomenon manifests itself from observation.

The present study has an exploratory dimension, as it is a subject that has been understudied, but of great value for the Strategic Management field, especially in this high-oriented technology world. Therefore, it was understood that the best way to reach the objective of this investigation would be through qualitative research, since it places greater emphasis on the interpretation of phenomena. As suggested by (Ugwu & Val, 2023) “qualitative research is the study of the nature of phenomena, which includes their quality, different manifestations, the context in which they appear, or the perspectives from which they can be perceived”.

This investigation was based on a set of primary data, obtained through the conduction of structured interviews and secondary sources, through bibliographical research and treatment of information, understood in the systematic study developed in books, magazines, and articles. While structured interviews are commonly used to identify patterns and trends, it can also serve as a means to gather qualitative information. This is achieved by designing a predetermined

script with carefully crafted questions that allow interviewees to freely express their opinions, experiences, and perceptions. Which means, despite the existence of an interview guide that directs the interviewees to the subject-matter, there's freedom for the interviewee to develop the answers according to the direction he deems more appropriate. This approach made it possible to better explore certain subjects (of interest for the study) depending on the path taken by the different interviews. Besides, this type of interview is considered a great way to collect new, exploratory data related to the research topic, as it is interrelated to the expectation that the viewpoints of the interviewees are more likely to be expressed in a reasonably openly designed situation rather than in a standardized type of conversation, as in questionnaires (Mashuri et al., 2022).

This study relied on a non-probabilistic convenience sampling method, which means that the sample was composed according to the availability of the individuals approached. In this instance, individuals from various organizations who operate in the strategic and technological sector of the company were selected. It is noteworthy that these participants were currently working in these departments at the time of the interviews.

One crucial aspect of the investigation concerns the planning of the interview and the development of its respective script. In that sense, the interview guide was prepared with special attention, ensuring that data collection would meet the objectives of this research. The script was written following a tree map typology, meaning, as we progress through the questions, they also become centralized. This way and having in mind that this investigation's interest is to find the correlation between this strategic approach (RBV) and the upcoming field of Information Systems, generalization wasn't the primary objective. It is also important to emphasize that the sample for the interviews was intentionally selected to include participants who best represented the phenomenon being investigated in regard to their knowledge.

In this regard, the criteria for verification and demonstration of the research assertions, in terms of its underlying purposes, implicitly incorporated an applied nature and an exploratory dimension. This first case resulted from the attempt of investigating how organizations leverage their unique resources and capabilities to gain a competitive advantage through the effective

use of Information Systems, which was supported by an exploratory dimension given that the linkage between RBV and IS has not been fully explored or understood. It aims to uncover new insights, like the role of information systems in facilitating the identification and leveraging of firm-specific resources as emphasized by the RBV, identify new emerging trends and patterns in the relationship between these two fields, and explore the role of IS in RBV-based strategies. As for the means involved, it's an investigation based on a set of primary sources, through the application of surveys in the form of structured interviews, with open-ended questions, to individuals operating in the technological and strategical sectors in Grande Lisboa. As for the secondary sources, it encompassed bibliographic research and data processing, involving a systematic study conducted through scientific articles, journals, and electronic networks.

This thesis employs a qualitative research approach to explore and understand the relationship between the Resource-Based View and the Information Systems, which was applied through the analysis of a set of interviews, with the intent to identify recurring ideas and concepts related to RBV and IS. This research seeks to uncover the nuances of the RBV-IS relationship and shed light on how organizations can leverage this relationship to enhance their performance and gain a sustainable competitive advantage, focusing on comprehending the meaning that the participants assign to the phenomena under analysis, rather than interpreting it, since it is not possible to create new knowledge about a subject or solve the small and big mysteries of our world without intuition and imagination, if the various paths that can lead to an answer are not explored with an open mind (Vilelas, 2020). It was used thematic analysis for the data interpretation provided by the interviews, allowing a greater comprehension of the information given that it involves considering how the patterns found within the data depict particular conceptual or theoretical ideas (Lochmiller, 2021).

Given the objectives of this investigation, and regarding the primary source utilized, I should mention that interviews was considered the most appropriate method to gather information, since it not only because it builds a holistic snapshot, analyses words, reports detailed views of informants, but also because it enable interviewees to speak in their own voice and express their own thoughts and feelings (Alshenqeeti, 2014).

It is also worth noting that the structured interviews technique used, despite being based on a structured set of open-ended questions, allowed a flexible and not rigid character, which gave the participants freedom to express their thoughts and opinions without being constrained by predetermined response options, providing valuable insights in the subject matter. For that matter, this type of interview has its first advantage as it holds its direction, especially when compared to the unstructured type of interviews, where its direction is not carefully taken into account (Mashuri et al., 2022), while capturing not only the answers to the selected topics, attitudes and values of those who were interviewed but also the collection of many important data that could arise, generating valuable information. However, the diversity of responses in open-ended questions presents a challenge in comparing and quantifying data among participants, indicating a lack of standardization. Figure 3 details the coding and categorization of the interview corpus that gave rise to the qualitative analysis.

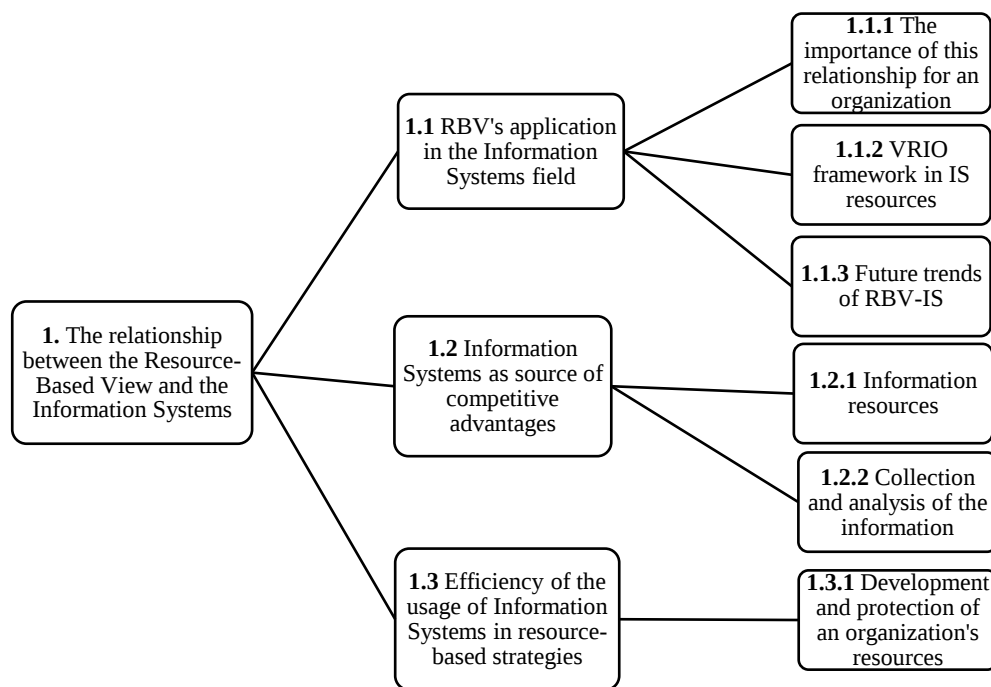


Figure 3 - Categorization of the Interview Corpus for qualitative analysis

Source: Author's elaboration

In summary, the first stage of this investigation focused on conducting a bibliographic research and information processing related to the Resource-Based View and the Information Systems.

The second phase involved bridging the theoretical construct with empirical observations to ensure the highest level of result reliability. The third stage included fieldwork and data collection through interviews within the considered research areas, and lastly, the fourth phase of this investigation went through the qualitative analysis of data retrieved from the interview, and its respective comparison. This process allowed for the development of new theoretical insights in the RBV-IS field and contributed to the understanding of this relationship, between resources and information systems, shedding light on their combined impact on firm performance and strategic management.

In the table 3, it is possible to analyze the relationship between the objectives of the study, the research questions elaborated in the theoretical approach chapter and the respective connection with the previously performed literature review.

Table 3 - Analysis model that relates the objectives of the study with the research questions and with the literature review.

Research Objectives	Research Questions	Literature Review
RO1: Understand how RBV theory and the IS field are related and how the RBV can be applied to IS.	Q1: What's the importance of the relationship between the Resource-Based View and the Information Systems field?	(Wade & Hulland, 2004); (Gupta et al., 2018); (Tarafdar & Gordon, 2007)
RO2: To ascertain the role of Information Systems in creating competitive advantages.	Q2: Do Information Systems have the capacity to guarantee competitive advantages?	(Mao et al., 2016); (Gupta et al., 2018); (Service & Maddux, 1999); (Díez & McIntosh, 2009)
RO3: To inspect how companies can implement IS and determine the importance that these have on them.	Q3: What type of resources and capabilities does a firm need to possess in order to be able to implement and exploit Information Systems?	(Aydiner et al., 2019); (Gu & Jung, 2013) (Mao et al., 2016)

RO4: To comprehend the usefulness and availability of Information Systems as resources and analyze the impact they have on companies.	Q4: To what extent can current Information Systems create value, rarity, difficult imitability, and how should the organization structure itself to benefit from them?	(Barney & Clark , 2007); (Mao et al., 2016); (Gu & Jung, 2013)
RO5: Identify the role of Information Systems in resource safeguarding and resource development within organizations	Q5: In what ways can Information Systems assist an organization in both safeguarding and developing its resources?	(Alkahtani & Norah, 2019)

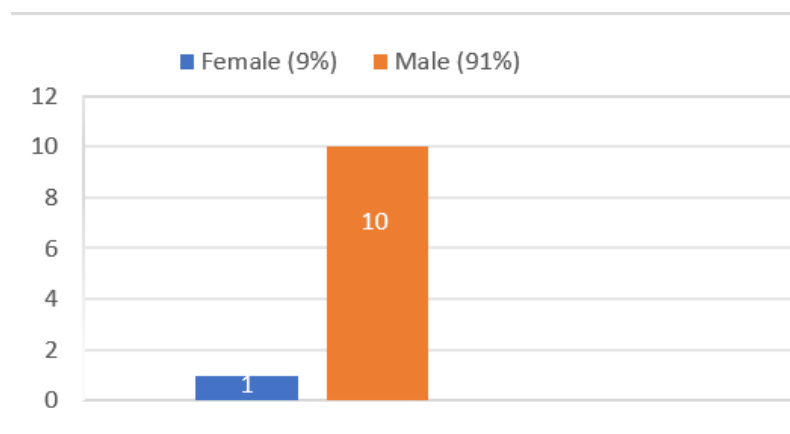
Source: Author's elaboration

5.2 Characterization of the sample

This study relied on a collection of primary sources, involving the conduction of 11 (eleven) semi-structured and structured interviews with open-ended questions. The interviewees were predominantly individuals working in the fields of Strategic Management and Technology holding primarily directive and coordinating roles, which allowed a more comprehensive data collection given the differences in the areas where they operate. Firstly, an analysis of all relevant variables, that could characterize the sample objectively, encompassing age, gender, and educational background, was conducted aiming to gain a deeper understanding of the sample's nature. Lastly, the answers given were subjected to content analysis to extract analytical data that would subsequently facilitate the derivation of both theoretical and empirical conclusions.

Of the eleven interviews that were conducted, one (9%) was with a female participant, while the remaining interviews were with male participants (91%), as illustrated in figure 4:

Figure 4 - Distribution of the interviewees by gender

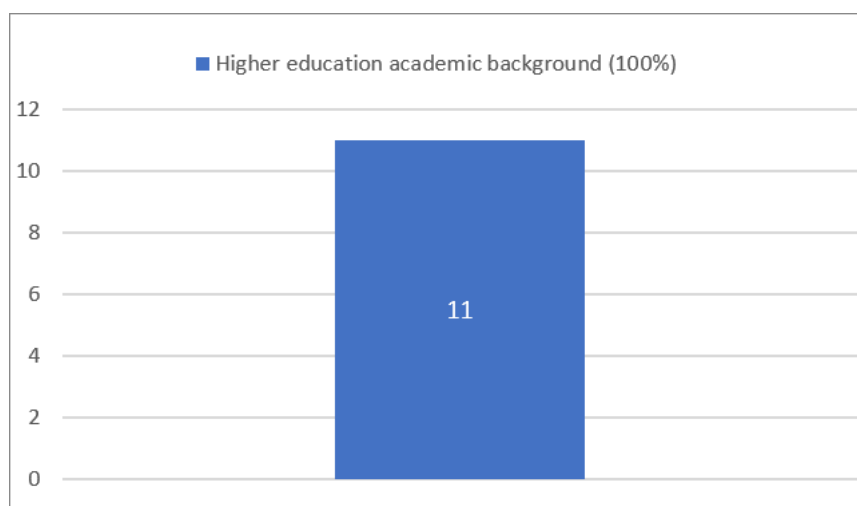


Source: Author's elaboration

Concerning the academic background, all participants in the sample have higher education qualifications. The largest proportion holds a Master's degree (54,5%), while four participants

have achieved a Doctorate degree (36,4%). Additionally, the remaining participant only holds an undergraduate degree (9,1%), as shown in figure 5:

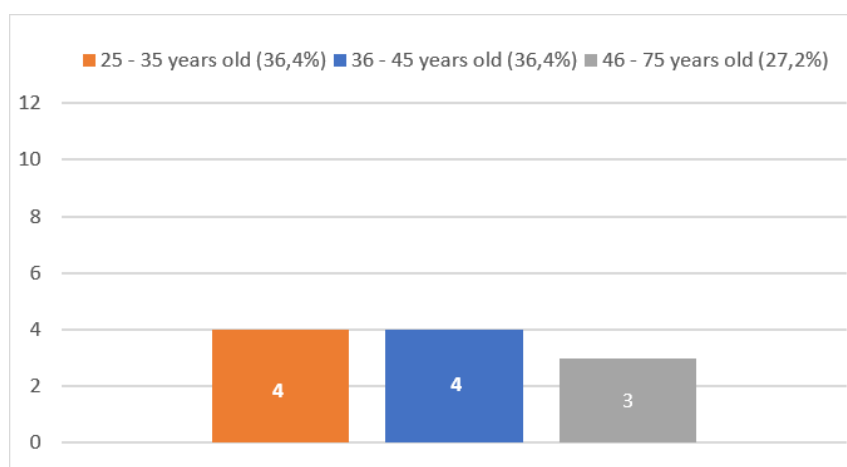
Figure 5 – Distribution of the interviewees by academic background



Source: Author's elaboration

Regarding the ages of the participants, a higher prevalence was observed in the age groups of 25 to 35 years (36,4%) and 36 to 45 years (36,4%), as opposed to the age group of 46 to 75 years (27,2%) – figure 6.

Figure 6 - Distribution of the interviewees by age



Source: Author's elaboration

Chapter VI – Data presentation and discussion of the results

6.1 The importance of this relationship (RBV-IS) for an organization

The primary purpose of this initial research question was to gather insights into the perceptions of the interviewees regarding the connection between the Resource-Based View (RBV) and the Information Systems (IS). It aimed to understand how the interviewees perceive the relationship between these two concepts and to examine into their perspectives on comprehending and skillfully handling this relationship. Additionally, it allowed to uncover why they believe that grasping and efficiently managing this relationship holds such importance for organizations that seek to boost their operational efficiency, especially in the ever-changing and dynamic business environment.

Out of the 11 interviewees, the prevailing view was that this relationship holds immense importance and significance to organizations. However, disparities arose in the comprehension and interpretation of the question, resulting in different insights into the reasons behind the relationship's significance. For the majority of the interviewees leveraging Information Systems is a pivotal aspect for organizations aiming to achieve competitive and sustainable advantages in the markets where they operate.

Six interviewees (i.1, i.2, i.4, i.6, i.7, i.10) assessed this question by asserting that taking advantage of the Information Systems is crucial nowadays in order to attain competitive advantages. They justified the interconnection between these concepts through *“the creation and maintenance of digital products, which is increasingly reliant on talent and technology”* (i.10), and though *“the utilization of Business Intelligence (BI) systems and tools that collect and analyze data from various internal and external sources of the company”*, which *“allow the organization to identify the performance of its resources, such as internal talents, exclusive technologies, or specialized knowledge”* (i.7). *“At the heart of this perspective is the notion that companies can achieve greater success by identifying, developing, and efficiently utilizing their current resources. In this context, IS play a pivotal role”* (i.2).

The remaining five interviewees followed different response paths. It was mentioned that *“the importance of information/data is one of the most powerful resources for a company, and it is through them that managers can make decisions”* (i.3), i.11 said that this relationship is notorious though the crucial support from the human resources department, and i.9 believes that *“one of the greatest current challenges is resource scarcity, and this challenge is more*

pronounced in terms of IS”, reason why, in certain cases, IS resources obey the VRIO framework. Two interviewees (i.5, i.8) didn’t provide elaborate insights, they merely emphasized that the relationship is extremely importance due to resource considerations. Table 4 presents some of the main arguments mentioned by the interviewees with regard to the importance of the RBV-IS relationship:

Table 4 - Significance of the RBV-IS relationship

Arguments	Nr of times	Interviewees
IS serve as tools to leverage an organization’s processes, enabling it to capitalize on existing resources, both in terms of value and organization.	4	i.1; i.5; i.6; i.7
IS as a valuable resource, when aligned to the organizational strategy.	3	i.2; i.4; i.5
Creation and maintenance of digital products highly dependent on talent and technology.	2	i.7; i.10
The analysis conducted by IS allow organizations to identify its resources performance, such as internal talents, exclusive technologies, or specialized knowledge.	1	i.7
Information resources stand as one of the organization’s most powerful assets, characterized by their possession of unique and rare data.	1	i.3
Provides fundamental support for human resources	1	i.11
Scarcity of resources is particularly heightened within the realm of IS, so the RBV focuses on their VRIO attributes.	1	i.9

Source: Author’s elaboration

With that being said, we can conclude through the analysis of the content provided by the interviews conducted, through table 4, and as affirmed by Wade and Hulland (2004), that the

RBV-IS relationship can be considered of great significance to attain superior business performance, as well as providing the firm with better insights when it comes to its resources.

Between the main arguments provided by the interviewees to assess the usefulness of the RBV when it comes to IS contexts, four stood out throughout the interviews, all suggesting that leveraging IS as resources can only bring success to organizations, which are: IS can be of great value, when correctly aligned to the organization's strategy, used for the creation, maintenance, and development of new products, opportunities and innovative solutions that add value to the firms, as well as serving as tools to capitalize and maximize the already existing resources.

It is also worth noting that throughout the interviews, an aspect that was constantly mentioned was that nowadays firms operate in much more technological and dynamic environments, and having an information advantage can be of great assistance, seeking new ways to take advantages of its Information Systems, in order to gain competitive advantages in such unstable and relatively agile markets, as the authors under examination argue (Wade & Hulland, 2004; Gupta *et al.*, 2018).

6.2 Information Systems as sources of competitive advantages

Regarding the second research question, its objective was to investigate whether the interviewees perceive information systems as potential sources of competitive advantages and to explore the roles these systems play in obtaining such advantages. The consensus among all the interviewees is that IS can indeed provide competitive advantages, emphasizing that its effectiveness for this purpose relies on how organizations implement and utilize these systems.

Between the 11 interviewees, 6 (i.2, i.3, i.5, i.7, i.8, i.10) consider that the key to attain competitive advantages through Information Systems is in the way they're used strategically, since nowadays technology is increasingly at the center of strategic decisions. *"Through the strategic use of IS, companies can obtain more accurate and up-to-date information about markets, competition, customers, and internal processes. This in-depth understanding of data enables more informed decision-making"* (i.7); *"the way they are configured, parameterized, and aligned with the business, as well as their ability to ensure agility and competitiveness at competitive values, is strategic"* (i.8).

An aspect commonly noted by two of the interviewees was also that IS can't constitute competitive advantages, only if the firms are organized enough to take advantage of them. In

simpler terms, having IS alone is not enough, organizations need to be well-structured to gain a competitive edge. *“Any IS only brings benefits if it addresses the needs of various stakeholders within an organization (...). Otherwise, they become constraints to the functioning of the organization, serving as barriers to entity’s growth”* (i.6); *“By themselves, IS are unlikely to have the capacity to ensure competitive advantages (...). The organization as a whole (...) must be prepared and organized, with the necessary focus, to identify and leverage its unique resources and capabilities”* (i.1).

The remaining interviewees provided varying responses concerning the question. *“Increasingly projects are composed of technology. Organizations capable of swiftly and effectively executing technological projects hold a competitive advantage”* (i.9), i.11 gave examples of how Information Systems can be used in the context of education *“(...) in the evaluation of personal/colleague performance, research unit, and courses”*, and lastly i.4 did not elaborate on how IS provides competitive advantages, only that they do.

After analyzing the answers given, it is possible to conclude that Information Systems have indeed the potential to be sources of competitive advantage. However, IS resources alone are not sufficient, there’s a need for organizations to align its strategies and structure themselves in order to extract the full potential of IS, otherwise they can become a limitation. These findings are in alignment with the perspectives of the studies of Wade & Hulland (2004) and Gupta *et al.* (2018), especially in obtaining sustainable competitive advantages. As stated by the authors, the sustainability of IS as competitive advantages is difficult, but, and supported by the interviewee’s insights, if their utilization is aligned with the organization’s business, and complemented with other internal and external resources and capabilities, it can be achieved and highly rewarding.

6.3 Implementation and exploitation of Information Systems

The objective of this third research question was to understand and inspect what’s needed for organizations to implement Information Systems and assess the importance of its exploitation for firms to attain superior performance, and consequently, sustainable competitive advantages. According to Mao *et al.* (2016), and as seen in the previous question, valuable IT resources alone are insufficient for agile business and cannot create value on their own, given that

organizations have found it easier to replicate the IS capabilities of their competitors, which makes us wonder if IS are really capable of contributing to superior performance.

The majority of the interviewees consider that IT qualified human resources are one crucial aspect for a better and higher efficient use of Information Systems, since “(...) *it can also become a factor of entropy in a business strategy. If the systems are improperly implemented (...), adding new systems will lead to a decrease in efficiency*” (i.4). Table 5 presents the primary resources and capabilities identified by the interviewees concerning this thematic.

Table 5 - R&C for IS implementation and exploitation

Resources and Capabilities	Nr of times	Interviewees
Human resources with expertise in the field	7	i.1; i.2; i.3; i.4; i.5; i.7; i.10
Organizational culture oriented toward the strategic use of Information	5	i.2; i.3; i.5; i.7; i.11
Financial resources to acquire, develop and maintain the necessary technological infrastructure	5	i.2; i.3; i.5; i.7; i.9
Ability to redesign processes and adapt them to digital transformation	2	i.8; i.10
Partnerships with reliable and innovative technology suppliers	2	i.2; i.7
How IS address the internal needs of the organization, not just potential constraints	2	i.4; i.6
Investment in the continuous renewal of employee knowledge	1	i.3
Knowledge of current systems and competition, as well as the trend of evolution	1	i.8

Source: Author's elaboration

After analyzing the table, we can affirm that there's a strong percentage of the interviewees that considers qualified human resources as the main resource to take advantage of Information

Systems, which comes in accordance with the perspectives presented in the studies of Gu & Jung (2013), where the authors defend that IS resources and IS capabilities are defined as a multidimensional construct. Also, and as shown in table 5, we can observe that a large portion of the sample agrees that having a good sense of the business and being culturally organized, as well as being agile and adaptable to continuous changes in the markets, can play a big part for organizations aiming to achieve superior performance, and by consequence, sustainable competitive advantages.

An important aspect noticed in the interviews conducted, supported by the research of Ravichandran & Lertwongsatien (2005), is that possessing sophisticated IS infrastructure, along with strong relationships between companies and their suppliers, as well as IS managerial knowledge holds significant value for organizations, and constitute key contributors to a positive impact on firm performance. In light of this, and validating the theory presented in the literature review, it's possible to conclude that IS resources and IS capabilities are crucial aspects to influence firm performance, extending beyond mere technological systems. There's the necessity to understand the firm's business, the ability to adopt new technologies, and excel in the development and operation of IS, as well as having the capacity to perform strategically aligned planning, fast delivery, and cost-effective operations and support if the goal is to gain a competitive edge over rivals in the industry.

6.4 Information Systems and the VRIO framework

The fourth research question was mainly motivated by the research of Wade & Hulland (2004) and Gupta et al. (2018), where the authors outline the difficulty that RBV theorists have had in defining what is meant by a resource. In their studies, Wade & Hulland (2004) considered resources as assets and capabilities that are available to the firm, and useful in detecting and responding to market changes, opportunities, and threats. So, I intended with this research question to evaluate how IS can be considered VRIO resources, and consequently analyze its impact on organizations nowadays.

In table 6 it's possible to observe the interviewees main inputs regarding the question.

Table 6 - VRIO for Information Systems

Inputs	Nr of times	Interviewees
Continuous reinvention of the business model, and the abandonment of analogic technologies	5	i.1; i.2; i.4; i.7; i.10
Improvement in operational efficiency, problem-solving and decision making through data analysis	3	i.2; i.3; i.11
Improvement in client experience through a more tailor-made service	3	i.2; i.4; i.5
Tools that support the organization's dynamic	2	i.1; i.6
IS provide valuable insights when used to extract, process, and analyze information	2	i.4; i.7
Investment and retention of experts is crucial	2	i.2; i.9
IT resources obey the VRIO framework	1	i.9
The response to VRIO is complex and contingent to various factors (activity sector, knowledge at disposal, investment capacity, etc.)	1	i.8

Source: Author's elaboration

Through the analysis of table 6, it's possible to observe that IS resources can have multiple positive implications in a firm's performance, if used correctly. For most of the interviewees, the most powerful aspect of using Information Systems is its ability to continuously create and innovate already existing products. This capability is a very valuable asset for organizations, as supported by Gupta et al. (2018), where the authors defend that firms that are not agile enough to detect and respond to change, fail to build, and sustain a rich portfolio of competitive advantages.

As shown in the results, and as discussed in the literature review, Information Systems can bring a lot of advantages. However, it still lacks comprehension when it comes to obeying the VRIO framework for a number of reasons. *"(...) Is intricate and contingent on the industry sector, the resources and knowledge at disposal, as well as the business's investment capacity and the management team's capabilities"* (i.8). Wade & Hulland (2004) argue that as currently

conceptualized, the RBV theory might not be optimally suited for analyzing Information Systems. To consider its applicability in this context, there should be an attribute that's meaningful within an IS framework. However, one interviewee believes that IS already obeys VRIO, as it considers that *“IT resources, nowadays, are highly valuable, rare, and quite challenging to replace due to their scarcity”* (i.9).

6.5 IS as resource safeguarding and development

The fifth research question revolved around understanding, due to the growing reliance on Information Systems, how companies should safeguard their technological resources, given the significant role they play in business development and in sustaining competitive advantages. RBV states that an organization's resources are the motor and the core of its performance, so it made sense to research on how these companies can protect its most valuable assets. Alkahtani & Norah (2019) state that the organization today requires an effective information security policy which not only involves a plan but also documents the roles and responsibilities to be followed by the firm personnel. Table 7 presents a summary of the main insights from the interviewees when questioned about the support IS gives to organizations in the development and safeguarding of its resources.

Table 7 - IS's role in resource development and protection

Insights	Nr of times	Interviewees
Capability of a company to adapt to new market dynamics	5	i.1; i.2; i.3; i.4; i.5
Enhancing the organization and the productivity of its members	3	i.2; i.5; i.6
Through RGPD policies	2	i.5; i.9
Through robust security systems, cryptography, and authentication processes	2	i.5; i.7
Development of a coherent career plan and the formulation of compelling talent retention policies	2	i.9; i.10
IS enable the modelling and analysis of business processes	1	i.2

Source: Author's elaboration

Taking into consideration table 7, we can conclude, and as confirmed in the previous questions, that Information Systems can assume a variety of functions for an organization. From a simple analysis of a product to the protection of all the assets owned by a company. Table 7 is a great example of that, since all the interviewees gave different insights for what you could expect from an IS when it comes to this thematic. However, it is important to highlight that IS without the expertise to handle it means nothing. *“Having information is not synonymous with knowledge. Often, systems are similar or identical among competitors. The distinction can lie in the ability to comprehend indicators, dashboards, and understand how to utilize them”* (i.8). This means, as supported by the literature review, that having the manpower capable of handling these systems is crucial for its management.

Also, with the increasing use of technology, cybercrimes and data breaches also become more frequent, constituting a main threat for organizations, which comes in accordance with the research of Alkahtani & Norah (2019) who state that *“the organization increased dependence on the information systems makes it imperative to improve its protective measures for security system management for safeguarding against multiple threats”*. The contemporary RBV of Information Systems is particularly relevant in this regard, since it *“can be used to understand and develop transient competitive advantages for firms that operate in relatively agile and dynamic environments”* (Gupta et al., 2018).

Chapter VII - Conclusion

7.1 Final considerations

Modern organizations are increasingly seen as knowledge-based enterprises in which proactive knowledge management is important for competitiveness (Hemmatfar et al., 2010). The potential usefulness of different kinds of Information Systems (IS) for environmental management is well recognized (Díez & McIntosh, 2009). This being said, this investigation had as primary objective the research and analysis of the relationship between an approach that is well recognized in other strategic management fields, the Resource-Based View theory, and the field of Information Systems. Additionally, it aimed to gain a better understanding on how IS contribute to firm performance and be a source of competitive advantages in an increasingly turbulent and unpredictable environment. Following an extensive literature review and conducting eleven interviews to collaborators who are involved in these fields, it has been possible to derive a set of pertinent conclusions regarding the proposed thematic.

While RBV offers a robust foundation for understanding competitive advantage through unique, rare, and difficult to imitate resources, the direct application of its framework within the Information Systems context is not a straightforward endeavor. As evidenced by the literature review, RBV's historical evolution and key principles underscore its significance in shaping strategic thinking. Yet, challenges arise when attempting to align this framework with IS resources, since these possess different characteristics compared to the traditional tangible and intangible resources proposed by Barney (1991).

This research has shown, through the literature analyzed and the interviews conducted, that while IS resources may not always constitute a direct influence in attaining superior performance, and by consequence, sustainable competitive advantages, they possess significant value in shaping dynamic capabilities and facilitating organizational adaptation. Despite not correlating directly with the traditional RBV resource attributes. One of the major factors in competitive environments is knowledge management and companies for achieving the competitive advantages should concentrate in its IS. IS has a vital role in business operation and financial and non-financial aspect such as decision making as a big role of management

(Hemmatfar et al., 2010). It is well noticed in the results obtained that Information Systems are considered the most powerful asset in organizations nowadays, since they provide the firms with up-to-date information which they can use to make better business decisions, and improve not only its organizational efficiency, but reinvent its business model as well, also supported by the researches of (Wade & Hulland, 2004; Tarafdar & Gordon, 2007; Gupta et al., 2018).

One of the primary objectives was also to understand how collaborators perceive Information Systems and examine the role they ascertain in creating competitive advantages. The general idea is that they have the potential to be a pivotal driver of competitive advantage, but if they're not handled correctly, can become constraints and limitations for a business. Furthermore, mishandling these systems might impede business growth with outdated information or redundant alternatives. In more extreme cases, this mismanagement could even lead to business insolvency. Therefore, possessing the requisite expertise to manage these systems is of paramount importance, as underscored by the interviews conducted and the perspectives of the authors studied.

Additionally, as we reflect on the objectives pursued, a pivotal goal revolved around the classification of Information Systems as resources possessing VRIO like attributes. Through meticulous analysis of the interviews, it became clear that IS resources indeed encompass these critical qualities. Their value stems from their capacity to enhance operational efficiency, play a pivotal role in problem-solving, facilitate informed decision-making, and foster innovation. Their rarity lies in their unique configuration tailored to each organization's needs, also improving the customer experience, as well as granting them a distinct competitive edge. Furthermore, being these systems tailor-made to each organization, it makes it challenging for the competitors to replicate them, thereby embodying the characteristic of inimitability. We then can conclude, that is becoming increasingly apparent that IS resources, when correctly harnessed, can be aligned with the VRIO's framework essence. However, it is important to underscore that their effective classification is contingent on various factors, like the sector where firms are inserted, their investment capacity, as well as the need to a nuanced comprehension of both the technology itself and its integration within the strategic framework of the organization.

Lastly, supported by the case studies analyzed and the interviews, the empirical analysis conducted reveals that, as previously said, the strategic utilization of IS resources goes beyond a direct contribution to competitive advantage. As Wade & Hulland (2004) said “limiting RBV research to firm-level dependent variables may be overly restrictive, particularly in the case of IS resources that affect the firm at many levels. Firm performance is affected by a multitude of factors; thus, use of a single firm-level dependent variable may not capture this broader context”. These resources provide organizations with facilitated agility in saturated markets, knowledge sharing, and innovation, all of which are essential components of dynamic capabilities that fuel a firm’s adaptability. It is here that the symbiosis between Information Systems and Resource-Based View becomes evident – IS resources stimulate the development of intangible resources, consequently reinforcing an organization’s resilience and adaptiveness.

7.2 Research Limitations

During the development of this dissertation, and even though the set of objectives have been met, it is imperative to acknowledge certain limitations. The awareness of these limitations was a constant consideration throughout the research process to ensure the avoidance of reaching unsuitable conclusions.

Firstly, one of the constraints resulted from the construction of the interview script. Given the challenge posed by the limited availability and willingness of the sample to engage in the study, the questionnaire should have been as succinct and straightforward as possible, and in retrospect, it becomes evident that the questions should have been more meticulously formulated, with the intention of obtaining a different spectrum of insights that could have addressed other crucial aspects.

Another limitation is related to the subjective process in the construction of the interview corpus. Additionally, the researcher’s interpretation and analysis of the results might be susceptible to bias stemming from personal judgement, since the data was translated from Portuguese to English, introducing an additional layer of potential distortion.

Lastly, the most significant limitation was the study’s participation rate, as only eleven interviews were conducted. These interviews do not constitute a sufficiently large probabilistic

sample to draw robust conclusions. Although the obtained results do align with some of the presented literature, it's important to note that this wasn't the primary focus of this dissertation. The intention was to capture perspectives and gain a deep understanding of the thematic through a more comprehensive approach.

7.3 Future Research

Our recommendations for future research include using a quantitative analysis to gather data from a larger and more diverse group, with more expertise on the topic. A larger sample would allow for statistical analyses that could provide a more robust validation for IS utilization using RBV principles.

Also, since different industries may experience varying dynamics in the alignment of RBV with IS, it'd be interesting if future research could focus on specific sectors to understand how this relationship manifests based on the industry characteristics. Lastly, delving deeper into the role of IS in fostering dynamic capabilities could offer valuable insights. Exploring how IS resources enable organizations to adapt, innovate, and respond to market changes could shed light on the mechanisms through which IS contributes to competitive advantages.

In conclusion, the outcomes of this study offer a foundation upon which a survey or questionnaire can be constructed, using the presented findings as a starting point.

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