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People Management: A Perspective On The Challenges And Benefits Of The Application Of Virtual And Augmented Reality In Organizations

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ABSTRACT

As a competitive advantage, new technologies are increasingly impacting most businesses and are being progressively applied in several areas, including Human Resource Management (HRM). Virtual Reality (VR) and Augmented Reality (AR) are innovative technologies with guaranteed potential in various fields, such as entertainment, health, education and industry. They emerge as emerging tools with numerous applicability to different sectors of activity due to their ability to simulate real environments, involving and interactivity, being promising tools to support HRM processes. The objective of this article is to analyze how companies use VR and AR technologies to improve their organizational processes, especially in the area of people management, based on an understanding of the characteristics of the organizations involved. Methodologically, this study was carried out based on bibliographical and documentary research. As for the investigation methods, the qualitative, exploratory study and the multiple case study method were used, through interviews with managers. The work brings understanding about the evolution of applied technology in the organizational environment, its impact on the organizational strategy and how it connects with the competence development process. The main contribution of the study was to show that VR and AR tools have been used in the organizational scope, showing themselves as a rejected resource, capable of keeping up with technological innovations and organizational ness, in addition to exploring the need to think about ways to apply such innovations in People Management processes.

Keywords: Virtual Reality, Augmented Reality, People managemen.

1 INTRODUCTION

Increasing globalization and technological advances have created several challenges for organizations, which in turn need to be able to respond to the unpredictability of the market. Change is constant and competitiveness forces organizations to find ways to adapt, differentiate and gain competitive advantage (OLIVEIRA, 2021).

These organizational changes have made Human Resources Management (HGR) a strategic area of the organization, which plays a key role for organizational development. The applicability of technology in GRH has proven to be an important support tool for professionals in the area, with substantial and positive impact on people management processes and practices. Schumpeter (1997) proposes that innovation is conceptualized as a new good or a new quality of good, a new method of production, opening up a new market, use of new sources of supply of raw material or semi-manufactured goods or new organization of industry. This way of generating new opportunities may develop greater probability of atingir the success of today's organizations.

Virtual Reality (VR) and Augmented Reality (AR) are the latest innovations, which stand out for interactivity and immersion in virtual environments, so that individuals can enter a controlled virtual environment and interact with objects or people, as if they were physically present. Applicability and its potential are evident in several fields of activity, such as the health sector, games, education, tourism (BOGDAN-MARTIN, 2021).

Therefore , VR and AR can be technologies with great potential in GRH, by facilitating greater results and reducing the time ofsome activities, resulting in differentiation and competitive advantage.

Thus, this research aims to answer the question: "What are the advantages in the use of virtual and augmented reality technologies in People Management?"

Thus, this article will be structured as follows: in the first chapter will be discussed the main phases of the evolution of GRH from the historical point of view, present what is this technology of extended reality, its applications in diferentes sectors, what are the benefits and challenges of the current use of VR and AR, qualifying the use of these technologies as innovations, and discussing what are their advantages in developing the skills needed for Industry 4.0. Finally, the apresentação of the multiple case study.

Thus, it is intended to seek data and possible information related to the new technological paradigms that are being discussed both in the academic environment and in the market environment.

2 EVOLUTION OF HUMAN RESOURCES MANAGEMENT

Human Resources Management (GRH) has as main objective to attract, retain and develop people, and with this create opportunities for people to develop within the company, besides promoting

professional motivation so that it can ensure quality of life at work. As a key part of organizations, GRH has undergone several developments throughout history. It began in the 20th century, when the term Human Resources Management was still commonly known as Pessoal Management (HASLINDA, 2009; TUBEY *et al.*, 2015).

At the time, the function had an administrative character, and there was a need for control of the workforce and Human Resources (HR) had competitiveness as a basic factor. Subsequently, with the increase and growthof production and industry, and the increase in job creation, the first collective concerns with working conditions arose. (TUBEY *et al*., 2015).

According to Tavares (2011), at the beginning of the 20th century, the way of managing employees consisted of an inhuman work system, in which the well-being of people was not considered a concern. Workers were required to work in which physical strength was fundamental, and for which no qualifications other than manual dexterity were required. In addition, during the Industrial Revolution there were many transformations in organizations. At the time it did not have an effective system of people management, as this was carried out by the owners or family members of companies with poucto or no training in management, only taking into account the intuition or experience of the work performed.

Henry Ford had almost an obsession with efficiency, and had the intention of advising his collaborators to achieve greater well-being in the work, thus creating a sociological department (TAVARES, 2011). Later, one begins to think more about human well-being during work functions, without neglecting the productive factor and controlling costs. Motivated by technological change, the 1980s were a decade of great evolution in the area of GRH, from which workers begin to be considered strategic elements for the organization (SOUSA, *et al*., 2006).

In the technical phase, in the mid-1950s, the human resources (HR) professional was recognized as the personnel administrator. At that time a denomination emerged, which hangs to the present day, the use of the term Human Resources Manager, literal translation of the *term Human Resource Manager* (MARRAS, 2016).

The GRH has undergone a great evolution since the 1980s, and this part is motivated by globalization and major technological changes (HALL, 2004).

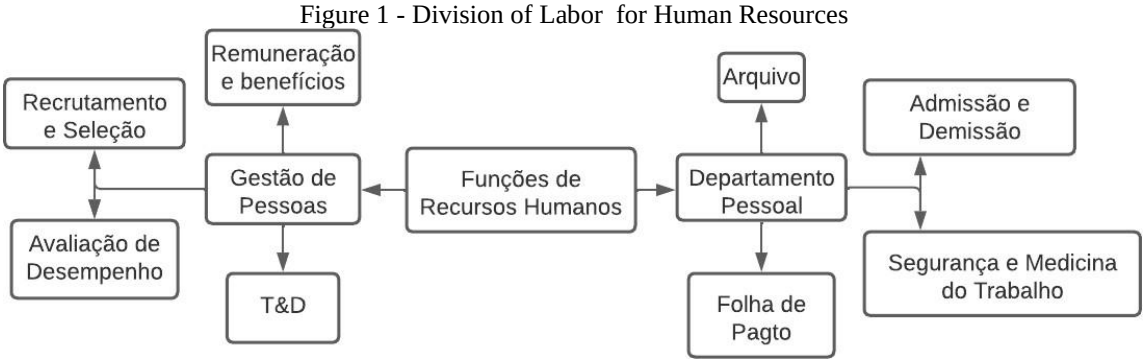
In the 1990s, because of the internationalization of business and economic activities, the concept and practices of HR also had a conceptual evolution

(CAETANO & VALA, 2002). At a time when globalization, competitionand the impact of technology have become the biggest challenges outside the organization, the competitive advantage of companies lies in the way people's knowledge is used, in order to put it effectively into practice, in the search for new products and innovative services. For Cowling and Mailer (1998), GRH plays a key role in facilitating change, because most organizations have to change to survive and change necessarily has to engage people.

Currently, GRH needs to be focused on the organization's business strategy and organizational learning. GRH operates at the level of the organizational cultur, in which each of the employees represents a contribution to competitiveness (BUREN III, GREENWOOD, & SHEEHAN, 2011).

Despite the flexibility of the HR area to act in different aspects, these processes can be summarized in Personnel and Human Resources Department. According to Alves (2020), the DP is very confused with HR, even if one sector complements the other, they have some differences. While the Human Resources sector is all part of recruitment and selection, evaluations and training, the Personnel Department in turn takes action for the admission of this employee to its workforce, requiring all the necessary documentation for this purpose.

Figure 1 - Division of Labor for Human Resources



Source: Prepared by the authors, adapted from ALVES (2020, p.1).

Technology has had a profound impact on all organizational processes, including the Human Resources sector. When it comes to personnel department and technology, we can cite *the software* used to store all employee documentation in an internal system, and when it comes to technology and People Management new technologies are seen emerging and changing the way organizationsrecruit, select and retain employees. And among the areas of people management, we can mention the recruitment and selection and training that mainly after the pandemic of 2020 had to change the way they retain new candidates. And with the help of new *technologies, online recruitment is* now "one of the most current, useful and dynamic applications of information technologies in the field of people management", and more and more people are turning to internet to look for professional opportunities, and so companies can even apply AR and VR to carry out their selection processes (PERETTI, 2007).

3 VIRTUAL AND AUGMENTED REALITY

Given the current business scenario of the 21st century, more and more organizations are adopting the use of technology to improve their processes of training and integration of employees, aiming to make the experience more dynamic and interactive, in addition to increasing the productivity. Such processes optimize the time of the company and employee, in addition to obtaining better returns on the capital invested in these processes, aims to develop attitudes of more motivated employees, who part of the team.

To better understand the importance of expanded reality in the processes of organizations, it is of great value to know how its emergence, as well as its creators, occurred through a brief history of its evolution over time.

Virtual Reality appeared with The United States Air Force flight simulators, built after World War II. Then it emerged in the entertainment industry. In 1962, Morton Heilig patented the Sensorama; from there came many other innovative idealists. (BRAGA, 2001, p. 1).

Virtual reality , as it is now known, has only had its name and future consolidated on behalf of Jaron Lanier. Responsible for being one of the forerunners of virtual reality and one of the greatest connoisseurs of this technology, building products since the early 80's (FILHO, 2018 *online*).

Augmented Reality, according to Lima:

The story of Augmented reality begins in 1968 with Ivan Sutherland developing the *system the Head Mounted Display* (HMD), this system with images by *wireframes*. In 1975, Myron Krueger developed the "*videoplace*" this project detected the movements performed by the user, producing virtual reality. In 1990, Tom Caudell developed an augmented reality system similar to glasses to assistin aircraft maintenance. (LIMA, 2020, *Online*).

In the 21st century, with the evolution of Virtual Reality, there are several types that differ according to the level of immersion and interaction with the user, in which the most used today are: simulation "that makes whatand the user feel completely immersed in the world virtual chosen through special glasses, headphones and other equipment according to the chosen experience" (FILHO, 2018, *online*), and augmented reality "user is outside the virtual world, but interacts and communicates with characters or virtual objects within their own environment. It works best in large environments, and can have interaction from several people at the same time" (FILHO, 2018, *online*).

In this context, the expanded reality was observed as a tool of great importance for organizations since it makes companies achieve differentiated efficiency and quality.

Therefore, the expanded reality haseffects in the sectors of industry, manufacturing and architecture, public services, talent management, retail, e-commerce and experimental marketing, business management, learning and training, in addition to industrial maintenance through remote action. Inthis form, this information demonstrates that the expanded reality is no longer science fiction, since this technology is integrated into the present and, in the coming years, will lead to advances that will

shape the future.

For better understanding, it is important to define the concepts of Virtual Reality (VR) and Augmented Reality (AR) described in the literature.

Virtual Reality (VR) is an "advanced user interface " for accessing applications running on the computer, providing visualization, movement and user interaction, in real time, in three-dimensional computer-generated environments. The sense of vision is often predominant in virtual reality applications, but other senses such as touch, hearing, etc. can also be usedto enrich the user experience. (KIRNER AND SISCOUTTO, 2007, p. 7).

The concept of augmented reality, in Kirner's visions; Siscoutto, (2007, p.3), are "[...] interfaces , tangible interfaces, etc., enabling users to access applications as if they were acting in the real world; talking, picking up, squeezing, making gestures, etc." The Spanish company Iberdrola (2022), adds: "Augmented Reality (AR) is a technology that allows us to overtake virtual elementsto our vision of reality." According to Pereira (2015, p.1): "augmented reality is a field of computing that studies the perception of the real world with information generated through a computer". Considering the concepts of expandida reality and its evolution over time, it is valid to explore the application of this technological tool in other sectors, such as educational, industrial and health. From this, it is possible to better understand the reality in which this technology isinserted. Moreover , the expanded reality is also used in human resources processes assisting in the management of people, contributing to the better development of employees in the organization .

4 RA AND RV APPLIED IN DIFFERENT SECTORS: TRANSDICIPLINAR APPLICATION

Given the evolution of technological tools, virtual and augmented reality has become digital phenomena and represents a disruptive change in various contexts of society, encompassing the impacts on the formof knowledge, industrial processes and even health.

Education is a field where virtual and augmented reality provides computational elements with three dimensions and that have the potential to enable a greater understanding and absorption of concepts, resulting in the engagement of students and improvement of learning (FILHO and DIAS, 2019).

According to Clark (2006), virtual and augmented reality can be used to make learning more interesting and enjoyable, in view of the impartation, motivation and attention, enabling the reduction of costs when no longer making use of the object and real environments.

Within the industry, another widely impacted area, augmented reality was established, in the field of engineering, as it was one of the first areas to use this technology as an example, the one that was applied in boeing's assembly line, which arrives in the 90's, making use of a real environment in the assembly of electronic aircraft equipment to design a system of overlap of virtual images, in order to assist employees in the assembly of equipment, periodic care related to their maintenance and restoration. (FERREIRA, 2014).

The health area is another that can benefit greatly from the evolution ofaugmented reality use, and can be used in several fields, assisting in the physical and mental health of patients. According to Ferreira (2014), in physical health, Augmented Reality can be used to train new doctors, who instead of training in real people, can make use of augmented reality to promote training; in mental health, Augmented Reality can help patients recover from insect phobias, for example, enabling the patient to have contact with the insect that not really present.

Given the above, it can be noted that virtual and augmented reality has been explored since the 1990s and several sectors can benefit from it and impact on how we will interact with our surroundings, generating various benefits and potentialities when applied in areas that are include the HGR.

5 BENEFITS AND POTENTIALITIES OF APPLIED TECHNOLOGY IN ORGANIZATIONS

In view of the multiple applications of virtual and augmented reality, Torres (2019) cites some advantages in using VR/AR in the scope of THE GRH, particularly in the integration of employees , stand out some in the sequence: it provides the newly arrived employee with the experience of knowing the organization completely, the areas, the co-workers and characteristics of the position; it increases the involvement and motivation; the process becomes more int attracting the employee; reduces bureaucracy in the work of Human Resources employees; increases performance; minimizes employee turnover.

According to Fernandes' studies, in the field of Human Resources Management and Development, it was found that:

HR professionals consider that the effectiveness in learning, the optimization and boosting of processes, the increase in motivation, the testing of candidates and the presentation of the organization in a virtual environment, the proximity and interactivity with candidates and collaborators, as well as the positive impact on the experience of employees are the main potentialof the use of RV and AR. (FERNANDES, 2020, p. 4).

It is worth noting that for these same professionals mentioned above, the application of VR and AR in Human Resources Management and Development can be fostered by the pandemic scenario caused by the COVID-19 virus.

In this sense, Fernandes also addresses that:

Human Resources Management (HCHR) has evolved simultaneously with technological advances and currently lives in a highly competitive environment. Virtual Reality (VR) and Augmented Reality (AR) are technologies inovations with recognized potentialities in several areas. Due to the ability to simulate real contexts, immersion and interactivity between virtual and real environments are promising tools to support THE PROCESSES OF GRH. (FERNANDES, 2020, p. 4).

Inthe field of recruitment and selection, the applications in Augmented Reality favor the reception of spontaneous applications, as well as the realization of the screening of candidates, reducing the time and cost of this stage. According to Araújo & Ramos (2002) *apud* Santos (2019), organizations have to accelerate the recruitment process in order to increase the productivity of the area. Peretti (2007) *apud* Santos (2019), cites another important advantage, which is the possibility of reaching people on a global scale and referring them to the profile objectified by recruiting entities.

Therefore, the use of VR technologies in hr promotes innovation, motivation and a better cost-benefit ratio (KHANDELWAL & UPADHYAY, 2019 *apud* FERNANDES, 2020). Therefore, the realitycome tual and augmented can be used as mechanisms of technological innovation, as they can provide beneficial impacts on the business model of the organizations that implement them.

6 VIRTUAL AND AUGMENTED REALITY AS TECHNOLOGICAL INNOVATION APPLIED TO NEW BUSINESS MODELS

The 21st century is characterized by accelerated changes in markets, technologies and organizational forms, so innovation should be seen as a very important theme for business growth and financial sustainability. Organizations use innovation as a means of gaining competitive advantage and generating profit.

Innovation is one of the forces that drive economic change and according to Schumpeter (1997), the reason for technological changes and innovations in companies is due to the fact that they are looking for profits. VR and AR technologies have proven their versatility,

because its immersive nature increases the presence in a real environment and allows to simulate situations or tasks, besides generating greater engagement than traditional methods. Therefore, using process innovation helps those inthe prey to achieve their goals and thus gain a competitive advantage.

Based on this understanding, strategic innovation focuses on business models. Companies reformulate their business concepts and adjust their strategies to gain u increase their competitive advantage (SKARZINSKI & GIBSON, 2008).

Considering the update of the Oslo Manual (2018, p. 76), it can be said that "A business model includes all major business processes, such as production, logistics, marketing and cooperative arrangements in use, as well as the main products that a company sells, currently or in the future, to achieve its strategic goals and objectives."

From this, it can be understood that innovation alsooccurs in the business model of a company, in fact, "a company's business model is an important place of innovation and an important source of value creation for the company and its suppliers, partners and customers." (AMIT; ZOTT, 2001, p. 493).

When it comes to the inovaction of the business model, the premise is that, to stand out from the competition, companies need to completely change the way they design their business. Hamel (2000) already pointed out the importance of the new business modeling logic at the beginning of the century: the strategy alone will no longer be enough to give sustainability to companies seeking to differentiate themselves.

Therefore, the innovation of the business model is equivalent to innovation that surpasses its competitors, since it refers to the discovery of a business model that is fundamentally different from the models of other companies however, when characterized as innovation, the new model needs to actually have some impact on the need to expand the market for innovative companies (MARKIDES, 2006). With this, the search for innovative tools such as VR /AR can provide a positive impact on business models, thanks to its interactivity and immersion in virtual environments. New businesses arise with the purpose of specializing in being suppliers of new technologies, which aims to solve problems in other companies, these new companies are known as Knowledge Intensive Services (SICs).

7 INTENSIVE SERVICES IN KNOWLEDGE AND CO-CREATION

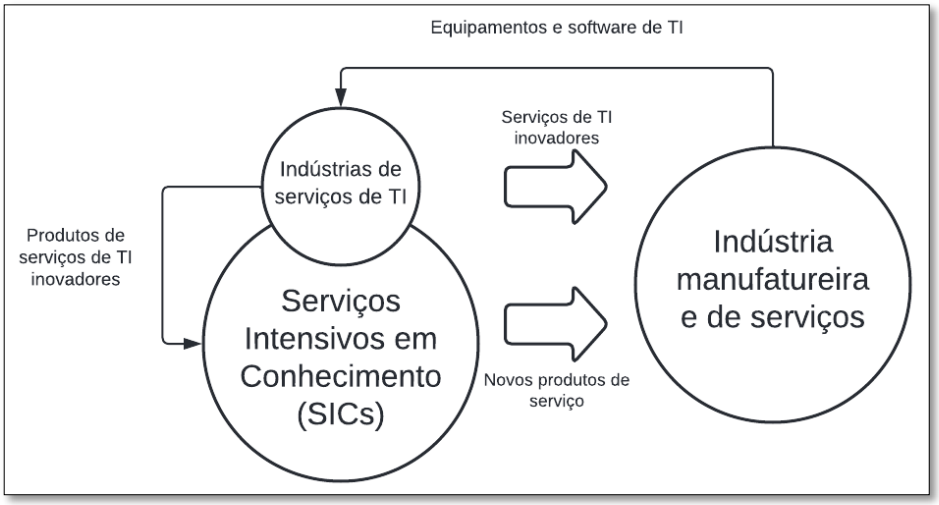
Innovations in Informationand Communication Technologies (ICT) have influenced how companies structure their business models. By using new technologies such as VR/AR, it is possible to positively impact business models due to their high interactivity and immersion in virtual environments.

The possibility of change in business models often leads to the emergence of new companies, a paradigm that is born independent of past trajectories and, therefore, are more free to innovate.

Knowledge-intensive services (SICs) play an increasingly important role, where knowledge and experience accumulated over time is used to build new solutions, and customers are co-creators of innovations developed as customer-specific problem solutions. This business has a special role in innovation systems, being "problem solvers" for advanced manufacturing companies and infrastructure services based on information and communication technology (ICT) (CASTELLACCI, 2008).

According to Hertog (2000), the SIC constitutes a class of highly innovative service activities and, in addition, can act as a facilitator of innovation in other economic sectors. They present private organizations that specialize in certain knowledge and provide knowledge-based products and services. A somewhat simplified picture of the role of Information Technology (IT) services as a component of SICs and the position of SICs companies in the innovation system is presented in Figure 2.

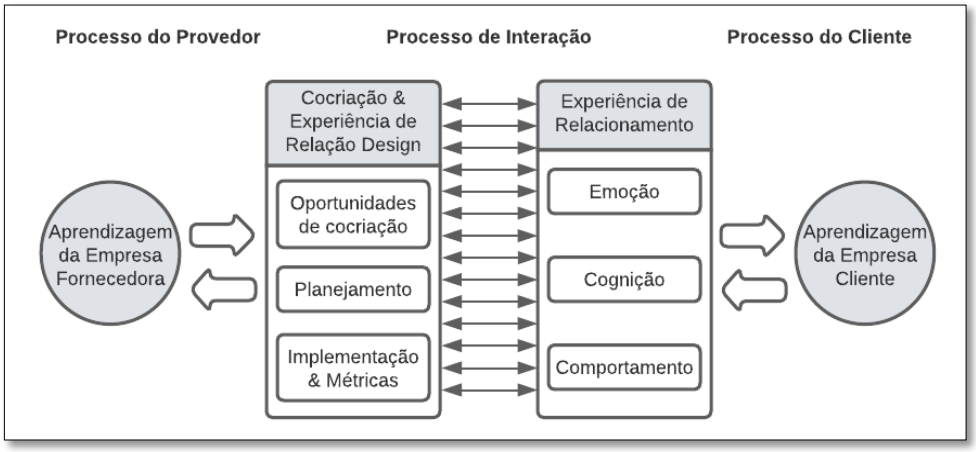
Figure 2 - The contributions of IT services and Knowledge Intensive Services (SICs) to innovation in the economy



Source: Prepared by the authors, adapted from BAARK *et al* (2014, p. 32).

Another important aspect of the industry that provides technology solutions to other companies is their co-creation relationships, as shown in Figure 3. Value co-creation is defined by Auh *et al*. (2007, p. 363), as "Constructive participation of customers in the creation and delivery of goods or services".

Figure 3 - A conceptual framework for the value co-creation process



Source: Prepared by the authors, adapted from PAYNE, STORBACKA and FROW (2008, p. 86).

According to Verleye (2015, p. 327) the "experience of co-creation is a multidimensional phenomenon", so factors such as connectivity, environment and *interaction between stakeholders should* be considered as the basis of co-creation.

Innovative VR/AR technologies are tailored to each company and its needs, and its approach is not standard, thus requiring a strong interaction between customers and technology providers, for this reason they are adapted to the concept of SICS, presented earlier. In addition, because they have immersive and interactive features, this technology can positively influence the development of the core competencies that are aimed at ensuring the differentiation of companies in the competitive market.

8 ADVANTAGES OF VIRTUAL REALITY AND AUGMENTED REALITY IN THE PROCESS OF SKILLS DEVELOPMENT

In general, organizations need increasingly qualified professionals to deal with processes and products that are increasingly complex, and the new model coming from industry 4.0 shows that specific skills are needed to act in this context. To enhance these skills, it is necessary to think of new forms of development, so innovations such as the use of virtual and augmented reality technologies are needed as they become more accessible and have the potential to provide stimulating interactive environments that help facilitate users' search for knowledge and critical thinking.

Competencies are related to putting into practice a combination ofattitudes, personality and personal knowledge acquired within an organization within the strategy and its culture. Fleury & Fleury (2001, p. 188) define competence as: " a responsible and recognized know-how, which implies mobilizing, integrating, transferring knowledge, resources and skills, which add economic value to the organization and social value to the individual".

Competence arises from a combination of motivations, traits, autoconceite, attitudes or values, knowledge of content or cognitive-behavioral skills, any personal characteristic that can be evaluated

or measured reliably and can be used to differentiate between excellent performance of a medium. Costa (2018, p.71) developed a new portfolio of competencies that deals with the theme industry 4.0, identifying competencies from the combination of the competencies portfolio developed by Schaper *et al*., in 2012 and the corecompetencies at *the World Economic Forum* in 2016. The result of this combination was compiled into key competence groups in order to meet the requirements of industry 4.0, illustrated in Table 1.

Table 1 - Competencies required by industry professionals 4.0

Skills Group		Skills
Skills	1) Cognitive skills	Cognitive flexibility, creativity, logical reasoning, complex problem solving, mathematical reasoning, observation, and analytical skills.
	2) Personal and mental ability	Knowledge in psychology, body language, resilience, and intra-entrepreneurial skills.
Basic skills	3) Content skills	Active learning , oral expression, written expression, written comprehension, and ICT literacy .
	4) Competence of proceedings	Active listening, critical thinking , self-monitoring and others , and interdisciplinary skills.
Interfunctional skills	5) Social and interpersonal skills	Coordination with others, emotional intelligence, negotiation, persuasion, service orientation, training and teaching others, social and ethical responsibility, virtual collaboration, and communication skills.
	6) System skills	Judgment and decision making, systems analysis, change and adaptation management, risk management and governance, complacency, and interpersonal skills.
	7) Technical skills	Maintenance and repair of equipment, operation and control of equipment, programming, quality control, design experience, and knowledge of new technologies.
	8) Intellectual skills	Language skills and open mind.

Source: Prepared by the authors, adapted from COSTA (2018, p. 71).

Given the constant changes in the business environment, which are often guided by the concept of megatrends, organizations need to be able to act quickly in response to changes in market demands, such as industry 4.0. According to Andrade *et al*., (2015, p. 4) "global megatrends are long-term transformation processes , with broad scope and dramatic impact on future markets." The use of innovations opens up the possibility of boosting processes in order to gain advantage.

With the correct use of innovative tools, the process of adding real value can become more efficient so that organizations can take advantage ofthe development of new competencies. Tools such as virtual and augmented reality are well suited to this need , as they are highly versable, their immersive nature increases the sense of presence in a real environment, and allows to simulate a situation or task and generate greater engagement than traditional methods.

In this context, it seems necessary to develop tools that enable organisations to develop skills more efficiently and effectively. According to Ceitil (2007,

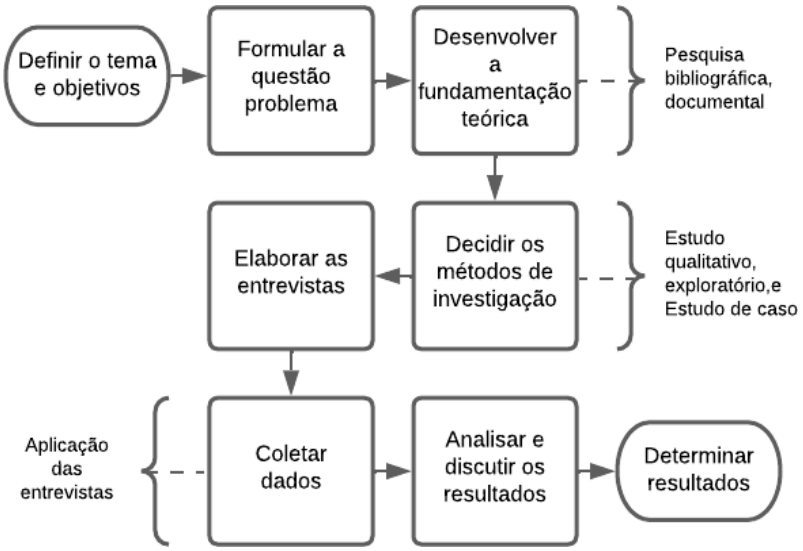
p. 78), more and more skills are perceived by companies as a differentiating factor and that can guarantee success in the face of competitiveness.

9 METHODOLOGICAL PROCEDURES

This research aimed to analyze how companies use virtual and augmented reality in order to improve their organizational processes, particularly in the area of management of people and skills, focusing on the business strategies of technology suppliers.

This objective will contribute to the expansion of a still little evidenced knowledge about how AR and VR technologies can be applied in the human resources area. This study will be classified according to the approach, the objectives andthe technical procedures, as represented in Figure 4.

Figure 4 - Research methodology designed for this article



Source: Prepared by the authors (2022).

This study is characterized by addressing issues inherent to virtual and augmented reality, with the objective of identifying how people management can use these technologies to improve organizational processes. With this, the multiple case study was applied through semi-structured interviews, as they provide the researches with the possibility of expressing their respective opinions in the investigation, through dissemination of their respective opinions, ideas and thoughts. The multiple case study was applied in companies that provide vr and AR technological solutions, and the main customers come from the areas of engineering, architecture, entertainingand advertising.

10 UNIVERSE AND SAMPLE OF RESEARCH

The research universe was composed of companies that work with virtual and augmented reality technologies, the search was performed through searches in the *google* tool and digital media.

It is important to emphasize that more or less 20 organizations were consulted with such technological solutions, however, three of these companies expressed interest in participating in the study. Therefore, it is worth mentioning that the sample of technology organizations to make the multiple case

study was made for convenience and opportunity, and not to increase the possibility of inferences (POZZEBON; FREITAS, 1998).

In this sense, three organizations were chosen, being located respectively in Rio Grande do Sul, Paraná, and São Paulo. In view of the panorama, the organizations wereinvited, through an invitation letter signed by the researchers, sent by e-mail addressed to the organization under investigation. The organizations that constitute multiple case study are : Costa frame, Space VR, and MASSFAR.

Interviews were conductedduring the second half of 2022 with the directors of the organizations, with great knowledge about the topics researched and with different points of view on the subject, the purpose of the interviews was to analyze how companies use the VR and AR technologies to improve your organizational processes. None requested anonymity, but, anyway, we intentionally chose to maintain the anonymity of the interviewees. It is emphasized that the interviews were conducted from October 2022 to November 2022.

11 RESULTS AND DISCUSSION

In this section , the characteristics of the companies analyzed in the development of qualitative research are described, followed by a comparative analysis of the results obtained with the semi-structured interviews. Those inprisoners interviewed were:

Costa Frame: The first organization interviewed is focused on architecture and engineering, offering virtual reality solutions for construction companies and events in general. Located in the state of Rio Grande do Sul, it has implemented these technologies in its portfolio since 2019, with the aim of expanding the areas of knowledge to the public and, therefore, do not fixate on only architectural projects. It is characterized by being a small business.

VR Space: The second ofthe interviewed organization operates in the virtual entertainment sector, offers innovation and entertainment solutions for shopping malls and the sale of licensing solutions, equipment leasing and provision of development services and modeling of virtual environments. It has its head office in the state of Paraná and aims to generate unique experiences, amuse and amaze audiences of all preferences and ages.

MASSFAR: The third organization interviewed operates in the service sector and itonsultoria, being a licensed partnership zappar company to operate commercially with the platform in Brazil and Portugal. He has more than 10 years of research and experience in the study and development of content for Augmented and Virtual Reality. It offers solid, innovative and high-impact solutions, with agile service, commitment and excellent cost-benefit. Located in the state of São Paulo , he specializes in transforming products, campaigns and ideas into interactive experiences that generate engagement, spontaneous media and financial return.

12 COMPARATIVE ANALYSIS OF RESULTS

The evidence collected in each company was comparatively analyzed and confronted with the premises presented in the theoretical framework. The authors summarize in Tables 2, 3, and 4 the results obtained for each question conducted in the interviews.

The three companies studied have the general purpose of offering an innovative solution that has enormous interactivity and the ability to simulate real environments, being great for generating engagement.

It is verified what are the characteristics of this market, the perspectives of these technologies and the advantages of their adoption. According to Chart 2, it is possible to observe the excerpts of the interview about the market view of the interviewed companies.

Table 2 - Market view of companieson AR and VR

Enterprise	1 - How virtual reality and augmented reality technologies are seen in Brazil?	2 - What are the profiles of companies that seek this technology? For what reason?	3 - What are the expectations of companies that seek this technology? What do they expect to achieve?
Coast frame	"... are not yet very widespread. Few have ever had contact with them. Those who have, find the technology incredible, but still do not seek to implement in their business."	"Generally construction companies, and companies for event interaction. Immersion in virtual reality allows the user to enter their future home (...) besides having real sensations [referring to the use in the construction sector]. On the other hand , companies that want to interact in events, seek technology to provide interactive and multisensory experiences through games, where the goal is to surpreender, entertain and engage."	"They hope to differentiate and stand out in the market, increasing the level of satisfaction of their audience."
VR Space	"Still as something embryonic and enthusiastic , the Brazilian market has not yet popularized th e technology."	"The most diverse profiles, but in general, are companies that seek the innovation of processes and be aligned with the technologies of the moment and the future."	"Generally speaking, companies seek to take a step forward with regard to the immersion of processes. It can be for the simulation of some activity avoiding risks or even provide your customers with some kind of simulation."
MASSFAR	"Unfortunately still with a very superficial look and total ignorance of the infinite possibilities of use."	"Medium and large companies and diversified segments, but generally product manufacturers (...) the reason that stands out is the need to add more value to product information and create greater engagement with the consumer connected."	"Differential in the product and in the way of communicating with its consumers, the search for greater engagement is always the main objective of brands."

Source: Elaborated by the authors, based on the data collected in the research (2022).

According to Chart 2, when asked how VR and AR technologies are viewed in Brazil, the three companies agree that the technology has not yet become popular in Brazil, they are seen with a superficial look, despite having great potential. It is noteworthy that companies have different points of view, because they offer solutions for different sectors and are located in different states of Brazil.

When asked which profiles of companies that seek this technology and the reason, it is possible to realize that they are of various profiles, the costa frame company is usually requested by construction companies, massfar, the company, its target audience, is the manufacturers of products. However, companies looking for such a solution are looking for a way to innovate their processes, adding value to their products or services through interactive experiences technology (CLARK, 2006).

According to the last question in Chart 2, it is possible to observe the expectations of companies that seek VR and AR. The three interviewees agree on the response, that companies that intend to adhere to this technology are looking for ways to obtain a competitive differential, through immersion and engagement. Technological changes and innovations are caused by the fact that companies are looking for profits (SCHUMPETER, 1997).

Table 3 presents what the directors say about the added value of technology.

Table 3 - Added value of the ap lication of AR and VR technologies in corporate customers

Enterprise	4 - What are the main benefits of using this technology?	5 - What skills can be acquired when using these technologies?	6 - By using these technologies, it is possible to generate a competitive advantage for Organizations?
Coast frame	"We work more strongly in the field of architecture, engineering and construction. The benefits in this area are: time gain and reduced execution costs; customer safety; allows you to view details; provides sensations of the environment."	"Innovation capacity; Creative thinking; Knowledge and familiarity with software; Adaptabilidade and flexibility; Vision global business ."	"No doubt! Virtual reality is a world of infinite possibilities for the most diverse areas of activity in the market."
VR Space	"Reducing the cognitive gap between an activity and its simulation compared to other technologies that use 3D or screens in two dimensions."	"Creativity; adaptability; cognitive flexibility; trial and taking decisions."	"Of course, it is an extremely innovative product that generates satisfaction in the people who use it"
MASSFAR	"Generate an image of a company connected and up-to-date with technological evolution, create engagement with its consumer, gain confidentiality and loyalty and increased sales ."	"Affinity and proximity to technological evolution, conquer a digital and connected audience."	"Absolutely so ."

Source: Elaborated by the authors, based on the data collected in the research (2022).

As expressed in Chart 3, when asked about the benefits of using VR and AR, the increase in interactivity, engagement and simulation capacity of real contexts are cited. Such benefits can generate a decrease in time and financial resources in the execution of processes (FERNANDES, 2020). When

questions about the competencies derived from its use, creativity, innovation, adaptability, flexibility and technological familiarization are more frequently mentioned. These are some of the competencies required by industry 4.0 (COSTA, 2018). Because they are high-quality tools versatility and immersion capability enable organizations using technology to develop skills more efficiently and effectively .

It was evidenced that for directors VR and AR technologies generate a competitive advantage for organizations, are considered an extremely innovative product and countless possibilities. By using an emerging innovation model to leverage their processes or products, organizations want to gain competitive advantage and generate profits (OLIVEIRA, 2021).

According to the answers of the directors in question 7, table 4, the costs of technology are very variable, depend on the type of project and the specification required. According to costa frame company "Projects that use some software pronto have low cost. Those who require some specific programming have a high initial investment, however, it provides their return over time."

Table 4 - Ar and VR implementation process in corporate clients

Enterprise	7 - Is the cost of these technologies high? Could it be a stop?	8 - What is the total implementation time? Need constant maintenance or follow-up?
Coast frame	"It depends on what will be used. For example, for interaction and gaming, the cost is cheap, as you will only need the glasses and ready-made games available. For the field of architecture, engineering and construction, one has an initial investment (...) then the expenses are the same as a conventional office , because the *same architecture software is used* to generate the projects. The cost is high when it is necessary to do something specific, with programming, because in this case, specific *"games*" are created for a certain demand [referring to the high cost of labor, not technology]. However, once you purchase, you will have the product "lifetime", being able to use as many times as you want."	"It's relative! If a company acquires the technology, which was purchased ready to use, it will have immediate implementation and does not need constant monitoring. Already a company that will work only with this, the implementation will depend on the knowledge that the professional has (whether he has or needsto acquire). The implementation time will depend on how familiar he is and how much knowledge he has with software. Maintenance can be considered the same as an IT department."
VR Space	"It's much cheaper than it's ever been. We are even cheapening technology in order to popularize this technology."	"Our new product is fast-deployed. About 30 days. It does not require preventive maintenance, only care for use."
MASSFAR	"Not much. It does not become an impediment because projects can be produced according to the available budget."	"Time and maintenance depend heavily on the complexity of each project. A simple Augmented Reality experience can be developed between 15 and 20 dias, while one of greater complexity can range from 90 to 120 days."

Source: Elaborated by the authors, based on the data collected in the research (2022).

As expressed in the last question in Table 4, the implementation time depends on the complexity of the project, and its maintenance is the same as that of an IT department. Deployment time can be up

to 30 days for simple, ready-made technologies. However, projects that have differentiated needs and a slightly longer period of up to 120 days. The development of specific projects with greater complexity requires the constructive participation of customers, and can be classified as co-creation processes (AUH *et al*., 2007).

In a way, it is observed that the three companies have similar views on emerging technological innovations in VR and AR, even providing solutions for different sectors and states. It was also observed the need for HR professionals to acquire skills such as curiosity, flexibility and global business vision in order to be able to understand and follow the scenario of constant innovations of the 21st century.

13 FINAL CONSIDERATIONS

GRH has constantly evolved to monitor and integrate technological development in its processes, with positive results for the Area of People Management and for organizations.

In this evolutionary scenario,technologies such as VR and AR emerge, which provide proven benefits in various sectors, presenting themselves as promising tools to achieve the competitive advantage that is so objectified in organizations. Such emerging technologiesalso have the potential for use in People Management processes , as they provide remarkable experiences in immersion and interactivity.

The trend is for VR and AR technologies to become popular and increasingly widespread across all industries around the world, making the user experience more complete. With the greater dissemination of this technology, it is perceived the importance of introducing it into THE HRM in order to streamline, simplify and strengthen the results of the different processes that manage people in organizations, ensuring that HR professionals have the digital skills necessary to apply it.

This study aimed to analyze how companies use VR and AR technologies to improve their organizational processes, especially in the area of people management, from the understanding of the characteristics of the organizations involved. On the basis of this main objective and through the specificobjectives, it was intended to find an answer to the research question " What are the advantages in the use of virtual and augmented reality in People Management?"

The main contribution of the results obtained, in particular in the study of multiple cases, is that the use of this technology brings advantages to organizations for its ability to provide realism to processes, through increased interactivity, engagement and capacity simulation of real contexts. These new technologies allow us to put into practice a combination of attitudes, personality and personal knowledge acquired, therefore, they drive the development of skills such as creativity, capacity for innovation, flexibility and adaptability. Among the many advantages that this technology brings to organizations, we highlight the reduction of riscos, time and costs in the execution of certain processes.

In this investigation, it was possible to verify something important: regardless of the focus

(sector, location, State), the impacts that the tool provides are very similar, which evidences the importance of thinking about ways to apply these technologies in the processes of People Management.

Another contribution of this study and the results obtained is the need to make human resources professionals aware of theneed to address the theme in order to monitor the practical evolution of the use of VR/AR. Often investing in these technologies is considered a challenge for some organizations and HR departments, which is not necessarily a factor in the reality presented by technology providers, who claim that values can be flexible and fit the available budget.

It is concluded that, from the academic point of view, there is an open possibility of research for future research on vr and AR applications in the area of Human Resources, due to the fact that this technology is becoming increasingly accessible and the existence of a high potential to improve the processes of People Management. It is suggested for future studies, the verification of the types of applications marketed by technology companies, more specifically those that are used in the area of Human Resources and its effective cost, as well as the possible negative effects of individuals who eventually have some kind of discomfort during the immersive experience.

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