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WILL THE CURRENT TECHNOLOGICAL CHANGES REQUIRE NEW SKILLS FROM CEOS?

SÃO PAULO - SP

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Thesis presented to Escola de Administração de Empresas de São Paulo, Fundação Getulio Vargas, for granting the title of Master of Business Administration.

Research Area: Organizational Behavior

Thesis Advisor: Maria José Tonelli, Ph.D.

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ABSTRACT

Organizational behavior scholars have been studying the work of executives for more than a hundred years. Since Henri Fayol (1916), Mintzberg (1973 & 2013) and Tonelli and Alcadipani (2004), not many changes have been seen in the executives´ job. Words like Forecasting, Planning, Organizing, Commanding, Coordinating and Controlling, first mentioned by Fayol's theory, are still present in their jobs. The few changes made in the CEO's activities are intriguing, considering the significant technological evolution that has occurred in the world at the same time. Now, with the existing fully automated and computerized information technology inside the workplace and digital applications used for surveillance and control; this study tried to understand, based on a qualitative approach, by interviewing ten Chief Executive Officers (CEO) in Brazil, the research question that guides this inquiry: Will the current technological changes require new skills from CEOs? A thematic analysis method was used in order to achieve these research results, which in a few words are: (1) Technological changes require new skills from the CEOs; (2) Human skills are predominant in the CEO's job; (3) Few changes have happened in the CEO's job; (4) The automation, computerization and surveillance processes require regulation; (5) Enterprise Social Media requires regulation. In addition, this work aims to benefit top management professionals, especially CEOs, human resource professionals and scholars of organizational behavior, more specifically those who seek to understand the impact of technology in the work of executives.

Key words: CEO. Management. Organizations. Skills and Technology.

RESUMO

Acadêmicos do comportamento organizacional estudam o trabalho dos executivos há mais de cem anos. De Henri Fayol (1916), Mintzberg (1973 & 2013) a Tonelli e Alcadipani (2004), poucas mudanças foram observadas no trabalho dos executivos. Palavras como Previsão, Planejamento, Organização, Comando, Coordenação e Controle, mencionadas pela primeira vez pela teoria de Fayol, ainda estão presentes no trabalho da alta gestão. As poucas mudanças nas atividades dos CEOs são intrigantes, frente aos significativos avanços tecnológicos que vêm acontecendo no mundo ao mesmo tempo. Agora, com a tecnologia da informação dentro do local de trabalho, com tudo automatizado, informatizado e os aplicativos digitais usados para vigilância e controle; este estudo buscou entender, com base na abordagem qualitativa, entrevistando dez CEOs no Brasil, a questão de pesquisa que norteia essa investigação: As mudanças tecnológicas atuais exigirão novas habilidades dos CEOs? Um método de análise temática foi utilizado para alcançar os resultados desta pesquisa, que, em poucas palavras, são: (1) As mudanças tecnológicas exigem novas habilidades do CEOs; (2) A habilidades humanas são predominantes no cargo de CEOs; (3) Poucas mudanças ocorreram no trabalho dos CEOs; (4) Os processos de automação, informatização e vigilância exigem regulamentação; (5) A mídia social corporativa exige regulamentação. Além disso, este trabalho tem como objetivo beneficiar profissionais da alta gerência, especialmente CEOs, profissionais de recursos humanos e estudiosos do comportamento organizacional, mais especificamente aqueles que buscam entender o impacto da tecnologia no trabalho dos executivos.

Palavras-chave: CEO. Management. Organizations. Skills e Technology.

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LIST OF ACRONYMS

CEO   Chief Executive Officer

AIMS   Association Internationale de Management Stratégique

US   United States

HBR   Harvard Business Review

GDPR   General Data Protection Regulation

SUMMARY

1 INTRODUCTION

For more than a century, organizational behavior scholars have been studying the work of executives; however, they have found no significant changes in the activities of these professionals throughout this time (Tonelli & Alcadipani, 2004). Fayol (1916) and Mintzberg (1973, 2013) argue that executive functions have basically remained the same during this period, for instance: Forecasting, Planning, Organizing, Commanding, Coordinating and Controlling. The few changes in the CEO's activities are intriguing, considering the significant technological evolution that has occurred in the world at the same time. For that reason, this study tried to understand whether the current technological changes will require new skills from CEOs.

Apart from technology, other vectors have implications in the current CEO's job, for instance: the aging population, the profile of the new workforce, climate change, globalization and the new sociocultural dynamics of cities, to name some of the most relevant. However, these vectors are not the focus of this inquiry.

The theoretical lens of this study was based on two fields, one was organizational behavior: considering the theories presented by Fayol (1916) in the classical Administration Industriélle et Génerále, and the research done by Mintzberg (1973) in the seminal The Nature of Managerial Work and updated in Simply Managing: What Managers Do and Can Do Better, Mintzberg (2013) which addresses the same topic as his seminal book forty years later. Still in organizational behavior, this study tried to understand the skills required from a CEO based on the Skills of an Effective Administrator, Katz (1974), revisited by Peterson and Van Fleet (2004).

Fayol (1916), in Administration Industrielle et Génerále, defined the six primary functions of management as follows: Forecasting, Planning, Organizing, Commanding, Coordinating and Controlling. He also defined the fourteen principles of management in his theory, which will be explored in the following chapter.

In The Nature of Managerial Work, Mintzberg (1973) made another seminal research about the work of managers, where he presents the activities of executives in eight schools of thought namely: The Classic School, The Great Man School, The Entrepreneurship School, The Decision Theory School, The Leader Effectiveness School, Leader Power School, The Leader Behavior School and The Work Activity School; and updated his research in 2013 with the book Simply Managing.

As the field of study of Fayol and Mintzberg are more focused on the functions and activities of top management, this study also examined Katz's article Skills of an Effective Administrator due to its solid impact on the managerial field. Katz's article is classified as an "HBR classic" in the Harvard Business Review. It has been cited in many academic studies and debates the importance of managerial skills for organizational achievement with the specific orientation of skills for managers, as described by Peterson and Van Fleet (2004).

The other field of study was the impact of technology in the workplace: considering the arguments of Zuboff (1988) in the seminal book, In the Age of the Smart Machine: The Future of Work and Power, and the relevant article written by Leonardi (2013) considering the impact of social technologies on organizations, Enterprise Social Media: Definition, History, and Prospects for the Study of Social Technologies in Organizations.

In this field, Zuboff (1988) states that: (1) Everything that can be automated will be automated; (2) Anything that can be computerized will be computerized; and (3) All digital applications that can be used for surveillance and control will be used for surveillance and control.

In addition, Leonardi discusses the consequences that social media used for communication and interaction within the workplace may have for those sociotechnical systems we call organizations. It is important to mention the concept of what technology is in context of this thesis. Technology is the processes of automation, computerization and surveillance, as studied by Zuboff; and the use of social media within the organizations studied by Leonardi.

The qualitative approach was the method used for this study. According to Creswell (2010), qualitative research is an approach for exploring and understanding the meaning individuals or groups ascribe to a social or human problem. Therefore, this research was conducted through personal interviews with ten prominent CEOs in Brazil working for Brazilian as well as multinational companies. As elucidated in the title of this paper, this is the research question that guides this inquiry: Will the current technological changes require new skills from CEOs?

This work may benefit top management professionals, especially CEOs, human resource professionals and scholars of organizational behavior, and more specifically those who seek to understand the impact of technology in the work of executives.

The following chapters of this paper are organized as follows: Chapter (2) presents the theoretical foundation of this study, in order to highlight the main concepts and definitions and thereby providing a theoretical basis for this study. Chapter (3) shows the research methodology, research strategy, interviewee selection, data collection procedures, data analysis

procedures and investigative interpretation procedures. Chapter (4) reveals the results obtained in the interviews with ten CEOs. Chapter (5) sets out the discussion of the results obtained and their theoretical support. And, Chapter (6) presents the final considerations of the study; including conclusions, limitations of the study, suggestions for further research and the practical applications this research can propose.

2 THEORETICAL FOUNDATION

2.1   Organizational behavior

In the eighteenth century, under the liberal ideas of Adam Smith, the skills and competencies of businessmen were justified by God's law. In the following century, the skills and competencies credited to those in command, were justified by his or her superior biological characteristics, seeking Darwin's scientism. Only in the early twentieth century, the American engineer Frederick Taylor introduced the concept of scientific management in his classic Principles of Scientific Management, where he defended the idea of training workers to perform better and to divide work between management and workers - with managers doing the planning and supervision, and workers carrying it out (Taylor, 1911).

A few years after Taylor's studies, the French engineer Henry Fayol released the Classical Management Theory in his seminal book Administration Industriélle et Génerále (1916). Fayol developed his theory about business management and general management based on his personal experience as a Mining Engineer. The main topics of his theory are the six functions and fourteen principles of management in his theory.

According to Fayol (1916), the primary six functions of management are: Forecasting, Planning, Organizing, Commanding, Coordinating and Controlling. It is important to mention that some authors use five functions instead of six, like Mintzberg (1973) who excluded Forecasting. Besides the functions of management, Fayol also addressed the principles of management, dividing them into fourteen fronts, as can be seen in the following table:

Table 1 - Fayol's 14 principles of management

FAYOL'S 14 PINCIPLES OF MANAGEMENT	
Division of Work	Fayol believes that work specialization is the best way to use human resources so he thinks that work should be divided among individuals and groups to ensure that effort and attention are focused on specific parts of the task.
Authority	Fayol defined authority as the right to give orders and the power to exact obedience. Responsibility involves being accountable. It means responsibility is a part of authority. When authority is assigned to anyone, responsibility is also assigned to him or her.
Discipline	Discipline is considered essential for the success of an organization. Good conduct and respectful interactions by the workers is necessary because the success of an organization requires the common effort of all workers.
Unity of Command	There should be a clear line of command in an organization so that workers receive orders from only one person or manager.
Unity of Direction	According to Fayol, there should be unity of direction for the success of an organization. It means that the entire organization should move towards a common objective in a common direction. Subordination of individual interests to the general interests.
General Interests	General interests and benefits of the organization should be given priority over the interests and benefits of any individuals.
Remuneration	Salaries of workers should not be based on productivity of workers, but it should be based on many variables such as cost of living, supply of qualified personnel, general business conditions and success of the business.
Centralization	According to Fayol, centralization or decentralization of management should be chosen according to the need of the culture and organization. He defined centralization as lowering the importance of the subordinate role.
Scalar Chain	There should be hierarchies of management in an organization. Authority should be assigned to each manager according to the status of managers in the hierarchy. Top level managers should be given the most authority and vice versa. Lower level managers should always inform upper level managers about their work activities.
Order	There should be an effective and efficient operation in an organization. All personnel and materials have specific roles and specific places. In short, people and material should be in the right place at the right time.
Equity	Equity means that all employees should be treated as fairly as possible. For the success of an organization, basic rights, rules and regulations should be the same for all workers. There should be justice within the organization. It should also be kept in mind that salaries and facilities cannot be assigned equally.
Stability of Tenure of Personnel	Firstly, Fayol believes that for the success of an organization, salaries and other benefits should be paid according to the length of service. There is a cost for new recruitment. Secondly, a new worker requires time to be more efficient.
Initiative	For continuous improvement of an organization, management should encourage worker initiative. There are some workers in organizations who are innovative and take steps to perform their tasks with more interest..
Esprit de Corps	It simply means that management should encourage the harmony and general good feelings among employees because harmony and good relations amongst workers increases productivity.

Source: Elaborated by the author based on Fayol's management principles.

Fayol's theory is very popular and still in practice today and the functions of management given by him are still placed in management functions of all organizations.

2.2   The first studies of executives

According to Tonelli and Alcadipani (2004), only a few changes have taken place since the classical works of Fayol (1916), Carlson (1951), Barnard (1971), and Mintzberg (1973). Executives continue to perform the same kind of job and carry out the same kind of activities as those described in the classical literature.

The Canadian scholar Henry Mintzberg, more than half a decade after Fayol's classical theory, did another seminal study about the work of managers, on the field of organizational behavior. In his book, The Nature of Managerial Work, based on one week of observation of five CEOs, Mintzberg (1973) presented his view on the manager's job in three roles: interpersonal, informational and decisional. Also, he presented his views on the managerial work at that time, dividing them in eight schools, as follows:

Table 2 - Mintzberg 8 Schools

MINTZBERG´S 8 SCHOOLS	
The Classic School	It is based on Fayol's theory of the basic managerial functions: planning, organizing, coordinating, commanding, and controlling.
The Great Man School	It was developed by Carnegie theorists (Carnegie Institute of Technology, now Carnegie- Mellon University); describes the manager as an un-programmed decision maker who programs the work of others
The Entrepreneurship School	Where the manager acts rationally to maximize profits.
The Decision Theory School	Decision making begins with problems and goals; and then the action plans are laid out by the manager.
The Leader Effectiveness School	The study of leadership is the study of interpersonal behavior between the leader and the subordinates; this school was focused on the leadership.
Leader Power School	This school described how the manager utilizes power in order to be followed by the subordinates; he assumed that informal social forces of bureaucracy tend to dominate individual action.
The Leader Behavior School	According to this school, the leader is the best informed in the group; there is a hierarchy of leader authority; this school analyzed the leader's behavior.
The Work Activity School	It aims to analyze the characteristics of managerial work. These characteristics are based on observations and recorded activities by managers in a daily log.

Elaborated by the author based on Mintzberg 8 schools of management.

According to these eight schools, mainly in the Work Activity School, which were based on Mintzberg research, the author described the work of managers as follows: (1) The manager performs a great quantity of work at an unrelenting pace, he is responsible for the success of the organization and there are no tangible mileposts where work is finished and managers are perpetually preoccupied; (2) Activity is characterized by brevity, variety, and fragmentation. There is great variety on a daily basis focusing on distinct issues; (3) There is a preference for live action. Managers desire to have the most current information, and instant communication and feedback; (4) Managers are attracted to the verbal media. They prefer face to face meetings and telephone conversations. Three types of activities took place at scheduled meetings: ceremony, strategy making, and negotiation; (5) Managers are between the organization and a network of contacts. The manager maintains communication relationships with three groups: superiors, outsiders, and subordinates; (6) Managers have a blend of rights and duties; the manager is able to make a set of initial decisions that define his long-term commitments.

After his seminal book, Mintzberg continued to study the work of executives, in The Manager's Job (1990), Rounding Out the Managers (1994), Managing (2009) and Simply Managing: What Managers Do and Can do Better (2013). In his last book, Mintzberg's research was based on a day of observation of 29 managers at all levels who were distributed across private, public, and plural sector organizations. It is important to remember the 1973 book was based on one week of observation of five chief executives.

For a better understanding of this study, it is important to explain the difference between the terms "work" and "job". This research uses the word "work" always as a general term that refers to a physical or mental activity that is performed in order to accomplish or produce something. An example is in the title of Mintzberg seminal book The Nature of Managerial Work. Whereas the word "job" is used as a more specific term to refer to an activity that an individual performs in exchange for a specific fee or payment, eg: "the managers' job", mentioned by Mintzberg several times in his books.

In an article published for AIMS (Association Internationale de Management Stratégique) Mintzberg (2015) himself compared his first and last books in order to understand the changes in the manager's job along the time. In his 1973 book, Mintzberg found that work was much more systematic, presenting hypothesis on the effects of, for example, the nature of the industry, the level of the job, and the size of the organization. But in his 2013 book, he found some actors he assumed to be most significant in Managerial work such as national culture, where for example, managing in China versus the U.S may not be all that significant, while in

another, such as the form of the organization professional versus machine among others, may be more so than previously thought.

In the same article he reached the following conclusion: "At least what I call managing naturally in the last chapter of the new book hasn't change. What has changed is that now we have so much more managing unnaturally: leaders who sit on top, measuring and exercising their authority by remote control, instead of rolling up their sleeves and facing the fact that good leadership is embedded in engaged management".

2.3   The skills

Still in organizational behavior, it is important to understand the skills required for executives. Skills and competencies have vast content in the academia and there is no consensus about the specific skills that could be identified as being key (Barabel, 2019). Michel Barabel is a current and relevant scholar in organizational behavior, mainly in the field of skills; however, he has a focus on the workforce in general, not on the top management, which is the focus of this inquiry.

Thus, this study has elected Skills of an Effective Administrator (Katz, 1974) in order to understand the skills required for a CEO. In this article, the author proposed a three-category typology of skills: technical, human, and conceptual. Katz's article has had a solid impact on the managerial work and is classified as an 'HBR classic" in the Harvard Business Review. It has been cited in many academic studies and debates the importance of managerial skills to organizational achievement with the specific orientation of skills for managers, as described by Peterson and Van Fleet (2004).

The relevance of Katz's work as well as his approach to the specific skills of managers were the main reasons for being part of the theoretical lenses of this work. Within each category, technical, human, and conceptual, numerous more narrowly focused abilities could be identified, but Katz's observations of practicing managers suggested that these three broad categories were the essential set of managerial skills (Peterson &Van Fleet, 2004).

Technical skills – According to Katz (1974), technical skill is proficiency, based on specific knowledge, in a particular area of work. To have technical skills means that a person is competent and knowledgeable with respect to the activities specific to an organization, the organization's rules and standard operating procedures, and the organization's products and services. Technical skill is most important at supervisory levels of management, less important for middle managers, and least important for top managers such as CEOs and senior managers.

Human skills - In contrast to technical skills, human skills are proficiency in working with people based on a person's knowledge about people and how they behave, how they operate in groups, how to communicate effectively with them, and their motives, attitudes, and feelings. They are the skills required to effectively influence superiors, peers, and subordinates in the achievement of organizational goals.

These skills enable a leader to influence team or group members to work together to accomplish organizational goals and objectives. Human skill proficiency means that leaders know their thoughts on different issues and, simultaneously, become cognizant of the thoughts of others, consequently, leaders with higher levels of interpersonal skills are better able to adapt their own ideas to other people's ideas, especially when this will aid in achieving organizational goals more quickly and efficiently. Interpersonal skills are required at all three levels of management: supervisory, middle management, and senior management.

Conceptual skills - Conceptual skills allow you to think through ideas and work with them. Leaders with higher levels of conceptual skills are good at thinking through the ideas that form an organization and its vision for the future, expressing these ideas in verbal and written forms, and understanding and expressing the economic principles underlying their organization's effectiveness. Peterson and Van Fleet (2004), updated Katz´s work and argues that these leaders are comfortable asking what if or hypothetical questions and working with abstract ideas. Conceptual skills allow leaders to give abstract ideas some meaning and to make sense of abstract ideas for their superiors, peers, and subordinates.

According to Peterson and Van Fleet (2004), this skill is the most important for top managers, less important for middle managers, and least important for supervisory managers. While conceptual skills are less important at lower levels of management, to be promoted to higher levels of management, it is important to develop and demonstrate this skill at all levels of management. It is a skill that can be learned; consequently, it is important to take every opportunity to develop the ability to learn conceptually.

2.4   The impact of technology in the workplace

The word "technology" has a broad definition and this study aims to comprehend it in the context of this research. According to Buchanan (2018), technology is the development over time of systematic techniques for making and doing things. The term technology, a combination of the Greek technē, "art, craft," with logos, "word, speech," meant a discourse on the arts, both fine and applied in Greece. When it first appeared in English in the 17th century, it was used to

mean a discussion of the applied arts only, and gradually these "arts" themselves came to be the object of the designation. By the early 20th century, the term had embraced a growing range of means, processes, and ideas in addition to tools and machines.

By mid-century, technology was defined by such phrases as the means or activity by which man seeks to change or manipulate his environment. Even such broad definitions have been criticized by observers who point out the increasing difficulty of distinguishing between scientific inquiry and technological activity (Buchanan, 2018).

The computer invention, as we know it today, occurred in the mid-seventies; the commercial use of Internet begun in the early nineties, and many tools very familiar to all of us nowadays, such as Youtube, Whatsapp and Facebook have not yet completed twenty years. Since those creations, we have seen a huge impact on the way people communicate, produce things and, more recently, in the way people work.

For many years, scholars such as Chandler (1977) with this seminal book The visible hand, and Jacques (1995), author of Manufacturing the employee: Management knowledge from the 19th to 21st centuries have been studying the impact of technology on organizations and on the labor force. Chandler (1977) uses propositions to defend how and why the visible hand of management replace what Adam Smith referred to as invisible hand of the market place and Jacques (1995) presents a discursive history of industrial work relationship in the United States along the time.

Another important scholar that have been studying the impact of technology on organization is Soshana Zuboff, she first introduced the concept of computer-mediated work in a MIT research paper, "Psychological and Organizational Implications of Computer-Mediated Work" (1981), elaborated in an article, "New Worlds of Computer-Mediated Work" (1982), and published in full in the book In the Age of the Smart Machine: The Future of Work and Power (1988).

In this seminal book, a study of information technology in the workplace, Zuboff (1988) argues that technology represents intelligence systematically applied to the problem of the body. It functions to amplify and surpass the organic limits of the body it compensates for the body's fragility and vulnerability. Industrial technology has substituted the human body in many of the processes associated with production and has thus redefined the limits of production formerly imposed by the body. As a result, society's capacity to produce things has been extended in a way that is unprecedented in human history.

Written before the widespread penetration of the Internet, Zuboff (1988) argued that wealth creation in an individualized society would require leveraging new digital capabilities to

enable what she calls distributed capitalism. This entails a shift away from a primary focus on economies of scale, asset intensification, concentration, central control, and anonymous transactions in organization-space towards support-oriented relationships in individual-space with products and services configured and distributed to meet individualized wants and needs. In the context of her research on the implications of information technology, she has declared three laws: (1) Everything that can be automated will be automated; (2) Anything that can be computerized will be computerized; and (3) All digital applications that can be used for surveillance and control will be used for surveillance and control.

Zuboff´s great contribution on the work implications associated with the extensive involvement of information technology in organizations is still very relevant, even thirty years after the launch, In the age of the Smart Machine, according to (Kallinikos, 2010), she adds that the central themes of the book are equally or even more relevant today. Zuboff (2019) has recently launched another book The age of surveillance capitalism: The Fight for a Human Future at the New Frontier of Power where she criticizes behaviorism and surveillance for suppressing our sovereignty of self.

Following Zuboff's field of study, other authors have been contributing with the understanding of technological advances and their devices inside and outside organizations. One of the prominent authors is Paul M. Leonardi, whose research focuses on how companies can design their organizational networks and implement new technologies to more effectively create and share knowledge. He is particularly interested in how data intensive technologies, such as simulation and social media tools, enable new ways to access, store, and share information; how the new sources of information these technologies provide can change work routines and communication partners; and how shifts in employees' work and communication alter the nature of an organization's expertise.

In his relevant article, "Enterprise Social Media: Definition, History, and Prospects for the Study of Social Technologies on Organizations, Leonardi (2013) argues what consequences social media used for communication and interaction within the workplace may have for those sociotechnical systems we call organizations. Enterprise Social Media, defined by him as a web-based platforms that allow workers to (1) communicate messages with specific coworkers or broadcast messages to everyone in the organization; (2) explicitly indicate or implicitly reveal particular coworkers as communication partners; (3) post, edit, and sort text and files linked to themselves or others; and (4) view the messages, connections, text, and files communicated, posted, edited, and sorted by anyone else in the organization at any time of their choosing.

These enterprise social media are distinct from traditional communication technologies often used in today's organizations because those who use them can see conversations occurring between others in the organization who are not their communication partners and can distinguish social and work-related connections among them. In other words, rather than functioning as a channel through which communication travels, enterprise social media operate as a platform upon which social interaction occurs. Because this platform is digital, in contrast to the physical platforms of offices, conference rooms, and hallways that have traditionally been the stages on which most workplace communication is played out, anyone in the organization can participate at any time from any place (Leonardi, 2013).

Due to the dramatic changes in social interaction that enterprise social media portend, it is no surprise that industry analysts and the business press predict unprecedented transformations in the way organizations that adopt them will operate in the coming decades. This study tried to understand whether Leonardi's assumptions for the transformation in organizations can also be a vector of transformation for the CEO's activity and consequently their skills.

Zuboff and Leonardi are significant for this study as they contribute to understand what is researched on this thesis. Zuboff's studies on the impact of technology in a broader way, ranging from the individual to society; while Leonardi's studies on the phenomenon within organizations, seeking to understand the effects of technology on work relationships and interactions between all employees, regardless of hierarchical level, in the various communication platforms.

Finally, it is important to make it clear that, for the purpose of this study, technology is the processes of automation, computerization and surveillance, studied by Soshana Zuboff; and the effect of the use of social media on organizations, called enterprise social media, studied by Paul Leonardi.

3 METHODOLOGY

This chapter describes the methodological strategy adopted in the present study, aiming to find possible answers to the research inquiry. It also clarifies the type of research adopted, in addition to specifying the way in which the data were collected and analyzed.

3.1   Research approach

The purpose of this study is to understand whether the current technological changes will require new skills from CEOs. Considering the research question, this study will adopt an exploratory qualitative approach, both descriptive and analytical in nature, and its main focuses are on the meaning that respondents attribute to the topic and its involvement with it. One of the advantages of this method provides a great opportunity to gather precise data about what people believe and what their motivations are.

According to Creswell and Creswell (2017):

Qualitative research is an approach for exploring and understanding the meaning individuals or groups ascribe to a social or human problem. The process of research involves emerging questions and procedures, data typically collected in the participant's settings, data analyses inductively building from particular to general themes, and the researcher making interpretations of the meaning of the data (…) Those who engage in this form of inquiry support a way of looking at research that honors an inductive style, a focus on individual meaning, and the importance of reporting the complexity of the situation (p. 4).

And for a better understanding, much of the qualitative research explicitly tries to generate new theories and new explanations. In this sense, the logic behind it is inductive. Instead of starting with some theories and concepts that must be tested and examined, this research favors an approach in which they are developed, together with data collection, to produce and justify new generalizations and, thus, create new knowledge and visions.

Some authors reject the imposition of any theoretical framework at the beginning. However, it is very difficult for analysts to completely eliminate all previous frameworks. Qualitative analysis is inevitably guided and framed by pre-existing concepts. Often, what researchers are doing is checking for clues, that is, they are deducing particular explanations from general theories and observing whether the circumstances they observe are really consistent (Gibbs, 2008).

3.2   Data collection

As this research has a qualitative approach, the chosen method of inquiry is in-depth personal interviews that is carried out with one respondent at a time. This was purely a conversational method and invited opportunities to get in depth details from the respondent. As stated by Gibbs (2008), one of the characteristics of qualitative data is that they are essentially significant, but they also show great diversity. They do not include calculations and measurements, but almost any form of human communication including written, auditory or visual; as well as behavior, symbolism or cultural artifacts.

The first step of this research was to define and find the right number of possible CEOs to be interviewed and all within a specific period of time. This process in getting the interviewees was a great challenge, but it was still achieved within the stipulated time in the planning approved by the thesis committee in the thesis project.

The qualitative data was collected through one-to-one discussion interviews; and recorded and transcribed for further data analysis. It is important to note that the data collection method was based on the theoretical frameworks described in the previous chapter and sought to understand the perception of each of the interviewees about the topics.

This study was conducted through interviews with ten CEOs in Brazil working for Brazilian as well as multinational companies, nine of them in São Paulo. The decision to interview CEOs is because they are the object of this study and the research question that guides this inquiry: Will the current technological changes require new skills from CEOs?

At the beginning of each interview, the interviewer presented the context, objectives and expected research contributions. After that the interviewer requested authorization for recording the interview and declared that the purpose of the recording would be subject to further analysis within the context of this research. Finally, the interviewer guaranteed the anonymity of the interviewee. The script used to guide the researcher in the interviews is described in Appendix A and the questionnaire, designed to consider the main issues related to this research, is in Appendix B.

The script and questionnaire were used as a guide for the interviews, but according to the context of each interview the questionnaire was not strictly used by the interviewer. Thus, throughout the interviews, the researcher´s focus was to obtain from the respondent a description of his or her understanding about the topics, with the researcher always careful to avoid any bias.

According to Gibbs (2008), qualitative researchers must recognize that their work inevitably reflects their background and their origins, their environment and their preferences. As a consequence, it is good practice to be open to these influences and to provide a good description of how conclusions and explanations were reached. A fundamental aspect of this opening is the presentation of evidence in their reports through the use of citations.

In order to have relevant professionals interviewed, this research invited CEOs based on the author's network, what was possible due to the researcher's long professional experience. Some conditions were observed while searching for respondents, such as being at the time of the research exercising the role of CEO, working for relevant organizations in their market segments, and leading organizations from various industries.

To avoid bias, this study did not invite any CEO from technological companies, such as fintech and Internet oriented companies, because these companies are focused on one of the specific topics of this research. The author has preferred, for the reasons mentioned above, to focus on CEOs from traditional industrial fields, such as energy, real estate and finance, just to name a few. The profiles of each CEO are in the following table:

Table 3 - CEO's profile

ID	NATIONALITY	AGE	GENDER	FUNCTION	INDUSTRY
I 1	Brazilian	60 < 70	M	CEO	Real Estate
I 2	Brazilian	40 < 50	M	CEO	Consumer
I 3	Brazilian	50 < 60	M	CEO	Communication
I 4	Brazilian	50 < 60	M	CEO	Oil & Gas
I 5	Brazilian	50 < 60	M	CEO	Finance
I 6	French	40 < 50	M	CEO	Various
I 7	Brazilian	40 < 50	F	CEO	Communication
I 8	Brazilian	30 < 40	M	CEO	Fashion
I 9	Chinese	40 < 50	M	CEO	Energy
I 10	Chinese	30 < 40	F	CEO	Manufacture

Source: Elaborated by the author based on data provided by the interviewees

In total, there were seven hours and thirty-six minutes of interviews; of which just one of them was made by telephone, all the other nine were face-to-face interviews in each CEO's office, except one, which was held in a restaurant. Each interview took about forty-five minutes

and was recorded, ranging from 36 minutes to 1 hour and six minutes. It is important to mention the difficulty to get an appointment with these professionals.

3.3   Data analysis

As stated at the beginning of this chapter, this is a qualitative research that used the inductive method, to this end data analysis was performed using the thematic categorical analysis method. According to (Smith, 1995; King, 1998, as cited in Gibbs, 2008), "in phenomenological analysis, the term used instead of codes is "themes". Once again, it captures some of the spirit of what is involved in linking part of the text with thematic ideas that reveal the person's experience of the world.

This study sought to process the data through analytical procedures until it became a clear, comprehensible and reliable analysis. The data analysis started with a detailed examination of the transcripts of the interview recordings, done by specialized professionals and validated by the author. It is important to mention that this research did not use any qualitative data analysis software.

The next step was to categorize the information obtained according to the respective themes in the interview script. According to Gibbs (2008), one of the most important issues in coding is to ensure that it is as analytical and theoretical as possible. One should move away from codes that are simply descriptive and based on the interviewees' worldviews, preferring codes that suggest new, theoretical and analytical forms when explaining the data, and that was the way this research was carried out.

After that, in order to identify the key issues, a set of common elements that reflect a certain reality, concept or similar characteristic as well as similarities and differences in perceptions from each interviewee about those themes and, for each identified theme, the corresponding transcriptions were grouped in order to facilitate data analysis in the search for patterns and ideas and a critical reflection about the data analysis.

Finally, the recordings of the auditions were heard repeatedly, the transcripts were read several times, the coding process was also done repeatedly and the comparisons between the data of each interviewee were carried out in tables and maps exhaustively until finding the best that was achieved in the data analysis.

4 RESEARCH RESULTS

This chapter presents the results of interviews conducted with ten CEOs and, as described in the previous chapter, this research uses the term "theme" to capture the idea of what was involved in the data analysis. Taking that into account, this chapter is divided into five parts, one for each theme. The themes are the results of the questions asked to the interviewees, as well as the analysis of the content of the interview transcripts, based on the theoretical foundation presented in chapter two of this study.

The themes are presented in the following order: (1) The CEO's perception of the impact of technological changes on their skills; (2) The CEO's perception of the skills of an effective administrator (3) The CEO's perception of the changes on the CEO's job over time (4) The CEO's perception of the stage of automation, computerization and surveillance processes; (5) The CEO's perception of the stage of Enterprise Social Media in their organizations.

4.1   The CEO's perception of the impact of technological changes in their skills

This theme is related to the CEO's perception of the central question of this study: Will the current technological changes require new skills from CEOs? The research revealed that all respondents understand that technological changes will require new skills from CEOs. Furthermore, even if the CEOs were not asked which skills would be required, it was important to realize that all ten CEOs interviewed pointed out the ability to be in constant learning as the most relevant aspect, given the impact of daily technological innovations on their businesses.

To better illustrate the perception of the ten CEOs interviewed in relation to the central question of this study, see in the following table excerpts from the responses of each of the interviewees:

Table 4 - CEO's perception of the impact of technological changes in their skills

ID	TABLE - The CEO's PERCEPTION OF THE IMPACT OF TECHNOLOGY ON THEIR SKILS
I1	"(...) As a CEO, I must at least be aware of what is coming, and search, research, explore, investigate to see where it is coming from, because I will produce more, I will sell cheaper, I will sell faster, or suddenly I'm not going to sell, because now it's becoming fashionable to invest in an enterprise just to rent (...) if I don't look for a course, an event, a lecture what's going on out there (...)" "
I2	"(...) I believe so (...) the CEO will stop being a connoisseur to be a learner, that is it, this will be the CEO's greatest ability (...) because things are changing, what is coming is transformational, it has no comparison with what we had in the past"
I3	"(...) So, in practice, technological skills can no longer be exclusive to the technology area, before I had a technology VP in the agency and now I discuss technology with people on a daily basis because access to tools is more democratic (...) Because speed has such great value, (...) a beautiful backward idea has no use to me, a beautiful early idea can serve me"
I4	"Look, in my view it will certainly happen, because this is inevitable, it has already entered and is increasingly part of our daily lives, today whoever denies this is "dead ", is out of the way (...) speed is so great, it changes so fast (...) you need to update yourself, first you have to know how to read a lot about what is "going on" (...)
I5	"I think so (...) Always learn! Learning is a word that is continuous, some things distress me more within my goals, but what intrigues me most in my business is like this (...) in fact it is distressing because of 'technology's crazy speed, and it is distressing because you think you are never at the same speed at which innovations occur, this brings a little anxiety in fact"
I6	"But technology impacts the way we work, for example, I am in the implementation phase of a broad industry 4.0 program in our factories (...), but how am I going to adjust my workforce so that they know how to work with robots when today they do everything by hand? (...) before you were the leader and pioneer and now you are the follower and this is difficult to accept, especially when you have a successor in your career, you have to accept that young people will teach you how to work..."
I7	"(...) I have even realized that the moment we are in, being pulled by technology has required skills many times in the human field, are skills that I perceive much more easily detected in women than in men , I have also observed larger numbers of women reaching leadership positions due to relational skills which are more easily identified in them than in men, so this is up to further investigation (...)"
I8	" If someone says that technological changes will not require new skills, it won't be long before this company disappears from the face of the Earth (...) For me, as I said, I end up having a much more technical need than I think a CEO would normally have, then, I need education in several things, like the ones I mentioned, but in general terms, you should acquire knowledge to understand how these tools can impact your business."
I9	"(...) the answer is yes, but sometimes we tend to believe that we have only had recent technology changes in the last ten years, 20 years, but actually, I think a similar question must have been asked many times by people, maybe 100 years ago, or 50 years ago, (…) I think we should all learn more and more (…) If we don't update ourselves, it will not be enough."
I10	"(…) I'm not talking specifically about which technology will require skills from CEO's, even though I think it's happening, it is important to have someone in the team who really has a good understanding of the changes on technology (…) For me, specially, as an expatriate, I feel the need to improve soft skills, people skills, because of the cultural difference. I couldn't just communicate or talk in the way that I talk to my Chinese colleagues, so that's something I always have to hold back."

Source: Elaborated by the author based on CEO's interviews

This research could observe that CEOs are intrigued by the fast speed in which information travels inside and outside the organization, due to the recent technological changes, and how it impacts the way they develop their product and services. Furthermore, this

phenomenon makes them need to be constantly learning and updating themselves to deal with new terms and ways of conducting processes and people in this new reality.

4.2 The CEO's perception of the skills of an effective administrator

In order to delve into the theme of the CEO´s skills, a discussion took place based on Katz's (1974) seminal article, Skills of an Effective Administrator, which identifies three essential skills for all the leadership levels: technical, human, and conceptual. In this regard, seven out of ten CEOs interviewed revealed their need to improve their human skills, as mentioned in the following excerpts from the responses of three of the interviewees:

> "(...), the thing that worries me most as a company owner, as the company's CEO, is if I am prepared to deal properly with people; because when you have good people, when you can choose good people, you get what you want, and if you have good, intelligent, prepared people, they bring, make and use new Technologies." (I1)
> (...) human sensitivity is fundamental and then leading these people in a way that they deliver tasks, deliver demand, for this reason the human relationship is the most important of all for the CEO." (I5)
> "(...) this makes todays' CEOs have to wear the hat and be "the guy" of the relationship, who has to sew the relationship because it is no longer the role of HR, he has to understand behavior changes of people." (I7)

This research also observed that three of the CEOs perceived the importance of conceptual skills, as mentioned in chapter two, this skill allows them to think through and work with ideas, but somehow they also mentioned the importance of human skills and one of them gave the same relevance for the conceptual and human skills.

> "(...) Human interpersonal skill remains to be part of the past and of the future. For me it's a constant, although people are changing, the conceptualization might be the most important in all this." (I9)
> "(...) I think human skills. Maybe I would say conceptual and human are equally important (…) Technical and hard skills are secondary for a CEO, in my view, because in our organization we'll often have CTO, product, technology directors." (I10)
> "(...) I have three roles: allocation of resources, allocation of people and engagement and motivation of the team. It is a strategic definition, of course, but I will allocate the money, I will put people in the right place and then I will take care of everyone's motivation and engagement to move faster with a strategy that I will define." (I6)

In the responses of the interviewees human skills were predominant over conceptual skills and none of them have mentioned technical skills as a skill to be improved. These themes will be discussed in the next chapter, when we will compare the results found with those studied in the theoretical lens, presented in chapter two of this study.

4.3   The CEO's perception of the changes of the CEO's job over time

This study brings up the CEO´s perception about the evolution of their work over time and, despite a new way of dealing with management principles due to the current changes brought by technology to the business environment; this research observed in the analysis of the interviewees' transcripts that these management principles studied by Fayol and Mintzberg, among others organizational behavior scholars mentioned in this research, are still present in their activities and routines.

Eight out of ten of the CEOs interviewed, understand that the management principles, launched by Fayol (1916) and revisited in studies by Mintzberg (1970, 2013), still remain present in their routines, although differently than in the past according to them, greatly impacted by technology, as can be seen in the following excerpts from the interviews:

> "(...) there will have to be a new methodology to meet the reality that is much faster. So I believe it will exist but in different ways" (I2)
> "(...) The dynamics, in my point of view, remain very similar, effectively, the world is different, people's speed and people's needs are more pressing, and then you have to adapt to the new behaviors, but whatever the behaviors are, these words (Fayol's six functions) will last forever "(I5)
> "(...) maybe the speed with which these things happen makes this structure not so solid, it ends up being a little fluid, but I believe they are still part of our day-to-day life" (I8)
> "(…) And now, because of the technology changes, sometimes the changes happen faster, and more unexpectedly (…) To answer in a short way, I think Fayol's principle are there still there, but require a different way to implement." (I9)

The research also noted that among the eight who perceive Fayol's principles still present in their routines, two of them consider the classical management theory more current than ever:

> "(...) About Fayol's Principles, his thoughts are 100 years old, right?! But they are very up-to-date! (...) in the past, time seemed to last much longer. Now, there is no more Saturday, no more Sunday, the demand is there, it is present" (I1)
> "(...)These principles of management still remain, more and more. It's amazing how in 1916 and today the principles are the same, if you are not in control of what you do you are "dead", if you don't plan activities you are "dead", and one thing that I see that makes a big difference, everything that you can measure, that you can control, goes better, because people need control, it is an impressive thing, but it is real, everything you do not control escapes." (I4)

And despite admitting the presence of the classical theory on his job, one of the interviewees considers a need for anticipation instead of planning to meet the speed required in the current business environment and also the lack of control, according to him is not possible to control in the midst of so much information and speed.

> "(...)A CEO of a company like mine, multinational, with fifteen Thousand employees, ten billion in sales (...) If I am saying that I control everything, I am lying." (I6)
> "(...)I focus much more on anticipation than on execution. For me, anticipation is the key quality I need; according to speed, I have to move fast, I have to decide quickly, I have to execute quickly and I have to make changes happen much faster than before" (I6)

In the opposite direction, only one of the interviewees understands that the current work of the executives differs greatly from the general principles of administration, and believes that some of these principles have changed:

> "(...) So, I think that everything is changing in the management concept (...) The history of control, I control you… It is, I empower you, I don't have another year of strategic planning, I prototype. 'Ah, there is one cool idea? How much will it cost? Ah wrong? Ask again. Just don't make the same unprecedented mistake, otherwise we'll see the consequences quickly (I7)

It could be seen in this section that most CEOs perceive that management principles studied by organizational behavior scholars are still present in their routines. However, the CEOs interviewed believed they have nowadays a new way to deal with the classical theory, greatly impacted by the current fast-moving technology, which, according to the interviewees, require much more agility in their activities than it the past.

4.4 The CEO's perception of the stages of automation, computerization and surveillance processes

The CEO´s perceptions regarding studies on the impact of technology on their activities were also discussed with the executives. They were asked the stage they believed they and their organizations were in, considering the following statements presented by Zuboff in her book, In the Age of the Smart Machine: (1) Everything that can be automated will be automated; (2) Anything that can be computerized will be computerized; and (3) All digital applications that can be used for surveillance and control will be used for surveillance and control.

This research noted that all respondents believe their organizations are in an advanced stage concerning the phenomenon studied by Zuboff and this fact is impacting their business and the CEO's jobs, they also mentioned how these processes, especially surveillance, are impacting their activities, as can be seen in the following excerpts from the transcripts:

"(...) They are in an advanced stage, I believe this is the right thing to do for us, because this automation takes out error (…) And monitor, you have to monitor. In our case, we have to. Because if something happens and we don't have proof that we did everything right, it's going to be our responsibility. So, we monitor (…) I do feel like an individual, so I don't like that my traces can be found. Even sometimes when it says 'anonymous', or 'not connected to the real name', the activity is actually traced on the Internet everywhere. As an individual, I don't feel comfortable about it, and as you know, in China the government has cameras everywhere, but there are benefits(...)" (I10)

"(...)There are a number of tools available today to understand consumer behavior, and you start to tap into that very tenuous line of privacy and public data. Facebook showed us that this is quite advanced with Cambridge Analytica (...) Anyway, we do not know the level of surveillance that there is on us, but looking at the market today, and only taking into consideration the monitoring and customer behavior sector, we know that the tools are very robust for surveillance, you no longer have privacy" (I8)

It can be also observed in the transcripts of the CEOs interviewed a strong emphasis on their need to define regulatory rules for the automation, computerization and, mainly, surveillance processes, where they perceive some ethical limits are being broken, mainly when it comes to lack of privacy generated by the use of new technological tools.

"(...) There are no data protection laws for individuals, for private life, and everything that is happening with Amazon, with Facebook and all this. I think it is good to have rules, to discipline the subject a little (...) So, it is clear that surveillance is everywhere, but there must be a power to counterbalance, otherwise, it will be the end of society. And, within a company we have ethical rules, we do not control the employees, have rules for the use of IT tools." (I6)

"(...) We live in a guarded society, we live in total "Big Brother" and I think it only tends to get worse. I don't think that it will be the Data Protection Law that will give us more tranquility in relation to whom the data belong to, because we are talking about the fact that in Brazil this discussion is still very incipient, which is the question of people's emotional data, it is not just about data, but who the person is (...)If we consider that a large part of our non-privacy is in the hands of others , how do you deal with things, if nothing is regulated."(I7)

However, they understand that this phenomenon also brings a lot of optimization to their business, generating more value in the allocation of physical and human resources and also of intangible resources, such as those focused on the development of research and new technologies to structure their organizations aligned with current needs.

"(...)In agribusiness it is impressive, and even in construction, that is our business, everything is impressive, and everything is robotic, speed is necessary to have productivity". (I4)

"(...) I honestly spend 50% of my time watching my clients, and the level of detail I have from them today is one thing, again, not as much as maybe I had a few years ago with less regulation, but this is one of the greatest drivers of our business, that is, to understand our client, which only happens with a certain level of surveillance" (I7)

Finally, another relevant aspect pointed out in the research was the concern of most executives with the way automation process is widespreading and with the impacts of this phenomenon on the workforce. This theme caused a profound concern on the part of the CEOs, they recognize that the automation process is decreasing the need for human work and are concerned that many people qualified to do manual jobs will not be able to be employed in the near future, where the automation process will reduce the number of jobs, according to the interviewees.

"(...) I think, we will have to divide the workloads, one class of workers will work four hours and another class works another four hours, because there is not another way. I wonder where all these people will work?" (I4)
"(...) I tend to agree but I don't have the knowledge to elaborate on this, because I don't know the automation industries (…) Those workers, they basically know nothing other than working in the factory to put things together. And if you replace them by robots, what are they going to do?" (I9)

In this section we could observe how the CEOs are impressed by the relevance of Zuboff's theory and how they are in advanced stage in their organizations as well as in their jobs. They also ask for regulation in order to deal with the automation, computerization and, mainly, surveillance processes. Finally, they recognize that the automation process is decreasing the need for human work and are concerned that many people qualified to do manual jobs will not be able to be employed in the near future.

4.5   The CEO's perception of the stage of Enterprise Social Media in their organizations

Aiming at analyzing the impact of technological changes on CEOs' job, this research revealed the perceptions of executives regarding recent study that sought to understand the impact of technology on the workplace, enterprise social media in this case. The CEOs were asked the stage they believed they and their organizations were in, considering the theory presented by Leonardi, in his article "Enterprise Social Media: Definition, History, and Prospects for the Study of Social Technologies on Organizations, Leonardi" (2013).

This research noted that all respondents believe their organizations are in an advanced stage concerning the phenomenon studied by Leonardi and this fact is impacting their business and the CEO's jobs, however they have different perception about the use of social media enterprise eight out of ten of the CEOs interviewed perceived this phenomenon with concern, because they fear the loss of control of what comes in and out their organizations, including

confidential and strategic information for their business, as can be seen in the followings excerpt from the interviews:

> "(...) Companies should not be mistaken, they should be proactive and have a minimum of coordination to guarantee a minimum of basic control of the knowledge they have (...)" (I2)
>
> "(...) It is not so easy to control what leaves the company, as it is going to happen, so, you have to let people do and put some simple rules within the organization (...) we are an old company, some would say 'ancient' - I'm working on it (...)" (I6)

On the other hand, two out of ten perceived this phenomenon favorably, according to one of them, it is facilitating and increasing their productivity, as follows:

> "(...) we use some digital community tools for communication and they have totally changed our business, there is a much more fluid and open communication by our Slack, our Slack has no closed channel and everyone in the business anywhere knows everything that is happening at any time, so there is total transparency (...)" (I8)

Another important aspect revealed by all the CEOs was the difficulty they have to control what is published by their employees in social medias, where they can express their views on plural, internal and external networks, without any filter or agreement from the organization, as can be seen in the following excerpt from the interviews:

> "(...) it brings joy and concern, joy because you are there at your house or at the restaurant or your vacation and you may be solving a problem as if you were there physically being demanded (...). On the other hand, it brings a huge concern, because someone can take a selfie in here and post on Facebook saying: Look, I work here at (company name), here are my colleagues, and tomorrow this person does something irregular, and everything is accessible, this person is a representative of our company or any other company, this person can also post something that could mean homophobia, can post something that can be characterized as a crime, so today it is much easier for you as a company to be exposed to certain irregularities committed by people who are here, who are constantly on social media." (I1)

Furthermore, just as in Zuboff's studies on the surveillance process, this research noted that CEOs also addressed the use of social media among employees as a matter to be resolved in terms of regulation, because according to them, there is no regulation to establish what is allowed or not by the employees' use of social media, whether internal or external to organizations, where employees personal comments can have a negative or positive impact on the organizations where they work, as follows:

> "(...) the employee will suddenly speak ill of a competitor of yours on his Facebook page, but then you are not limiting his freedom of expression? (...) However, we have

> to remember that for an employee (...) they must sign rules of conduct, compliance, ethics, data protection and also the use of social medial, that's what I defend, that companies have to have a manual for conducting their social media, I have been managing immense crisis due to the misuse of social media." (I7)

Finally, we could observe on this section how the CEOs are analyzing the impact of Leonardi's studies about enterprise social media and the advanced stage this new reality is on their organizations as well as on their jobs. Most of them perceived this phenomenon with concern, mainly related with the possible loose of control of their organizations' confidential and strategic information and the difficulty they have to control what is published by their employees in social medias. They also ask for regulation in order to deal with this phenomenon.

5 RESULTS AND DISCUSSION

In this chapter the results obtained will be discussed in order to answer the questions formulated in this research. It is important to remember the central question that guides this inquiry: Will the current technological changes require new skills from CEOs? As well as the sub questions, that can be seen in Appendix B of this thesis.

The main discussions will be subdivided into the themes formulated in the previous chapter, and are presented in the following order: (1) Technological changes require new skills from CEOs; (2) The predominance of human skills in the CEO's job; (3) The few changes in the CEO's job over time; (4) The automation, computerization and surveillance processes require regulation; and (5) Enterprise Social Media requires regulation.

5.1   Technological changes require new skills from CEOs

This discussion is related to the CEO's perception of the central question of this study: Will the current technological changes require new skills from CEOs? This research revealed that all CEOs interviewed responded that current technological changes require new skills from CEOs. According to them, this is due to the speed that technological changes are spreading throughout their business environment and the demands that this phenomenon imposes on the CEO's activities.

This perception of the interviewees can be confirmed by the recent Bower Forum (2017), led by global consultant Mckinsey, where seventy-five chief executives and board chairs gathered to discuss how technology is changing the job of CEOs, share concerns, and offer one another advice. In this relevant Forum, two principal challenges facing many CEOs were examined: (1) how to manage their early transition into the top job, for example, weighing the benefits of making early moves versus taking time to assess and reflect; and (2) how to keep up with fast-moving technology, notably, how to better prepare themselves for the disruption that will more than likely confront their companies.

The second topic of discussion is closely related to the topic of this research and presented a similar result to that achieved by this one, as mentioned in the Forum's conclusions, where many Forum's members were convinced that technological change is the biggest, most disruptive force facing today's corporations and added that technology is not changing only

corporations, it is also changing the job of the CEO, bringing with it the challenge of keeping up with technological development.

This research also revealed that even though CEOs were not asked which skill would be relevant, they mentioned the ability to be in constant learning as the main skill of today's CEOs. According to them, this is due to the scenario of daily innovations brought about by recent technological changes.

This ability to be in constant learning, mentioned by the CEOs interviewed, can be confirmed by Seijts (2013), which explored the experiences of various leaders along their careers. These leaders from different industries, sectors, and countries brought to light several lessons on the importance of they experience in learning. These thirty-one leaders brought in practical insights, complemented by the authors research and theory, what they have been facing along their careers: the challenges, triumphs, reflections and, mainly how they learned to lead during their careers.

The book delivers important and useful perspectives into a theoretical framework that includes the importance of innate curiosity, challenging oneself, risk-taking, and other key elements of good leadership. One of the interviewed, Bob McDonald, Chairman of the Board, President and Chief Executive Officer, The Procter & Gamble Company, demonstrates the core of the results achieved in the research that gave rise to this book.

He mentioned he believes that what differentiates those who succeed in life from those who do not is the ability to learn. Leadership must be learned, studied and practiced. The most capable and successful leaders in business, or anywhere for that matter, have developed an insatiable passion to keep learning and honing their leadership skills. In Good Leaders Learn, Seijts (2013) aggregates in one useful and compelling source how some of the best leaders in our world today have harnessed their passion to learn to become and stay successful leaders with the ability to manage through good and bad times.

This section brought the discussion about the central question of this research and observed that all interviewed responded that technology require new skills from CEOs. On top of that, the respondents think this skill is about being in constant learning, as fast-moving technology is the biggest, most disruptive force facing today's corporations and is changing their corporations and it is also changing the CEO's job. It also important to mention that the results of this research found support in the current literature.

5.2   The predominance of human skills in the CEO's job

In this discussion is possible to affirm that seven out of ten CEOs revealed the predominance of human skills in the activities of the CEOs as well as their need to improve this skill. This discussion took place based on Katz's (1974) seminal article, Skills of an Effective Administrator, which identifies three essential skills for all the leadership levels: technical, human, and conceptual.

It is important to note that Katz argues that human skills is the leader's ability to observe how the workers operate in groups, to communicate effectively with them, and be aware of their motives, attitudes, and feelings. These are the skills required to effectively influence superiors, peers, and subordinates in the achievement of organizational goal (Katz, 1974).

Furthermore, Mintzberg (2013), argues that the attributes valued in a managerial work, do not fully meet the demands of the 21st century. In this way, he perceives an appreciation of interpersonal relationships and the relevance of the communication process in the manager's performance.

Three out of ten participants identified conceptual skills as more important, which is, to some extent, aligned with the studies presented by (Katz, 1974) on what skills are required for the leadership. Petersen and Van Fleet (2004), mentioned that leaders with higher levels of conceptual skills are good at thinking through the ideas that form an organization and its vision for the future, expressing these ideas in verbal and written forms, and understanding and expressing the economic principles underlying their organization's effectiveness. This can be observed in the figure below:

Figure 1 - Management Skills necessary at various levels of the organization
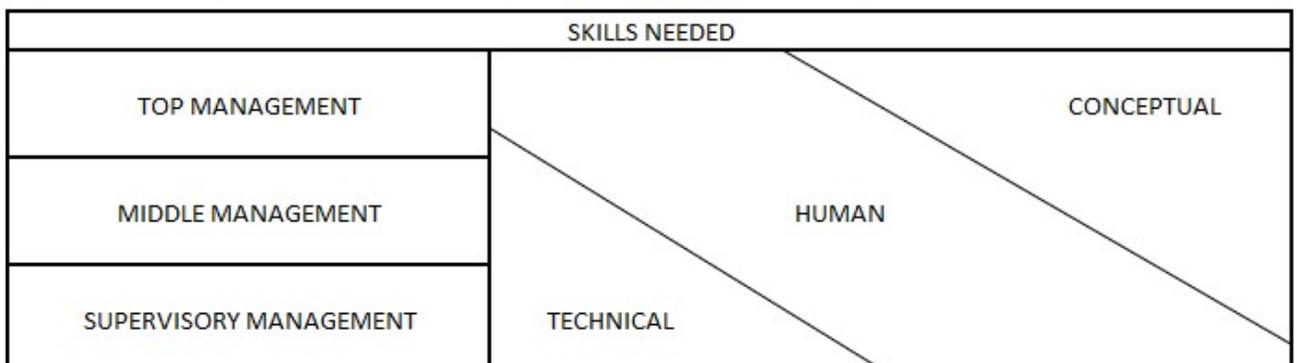
Source: Elaborated by the author, adapted from "Skills of an effective administrator" Robert Katz

Another aspect revealed by this research was the CEO's perception of the possible need to enrich technical skills, since some of the current components of the technological revolution require some level of technological knowledge, such as artificial intelligence and big data, called technical skills on this context. However, none of the interviewees understood that they have to improve any technical skill to deal with the new technological era.

Finally, this research could note the predominance of human skills followed by conceptual skills, it is important to mention that none of CEOs interviewed gave relevance to technical skills to perform their job. The result of this research brings something new when compared to to Katz's theory, according to him it is expected that conceptual skills should be more required than human skills for a CEO; according to his theory, the higher the position the greater the need of conceptual skills, closely followed by human skills and lastly technical skills.

5.3   The few changes in the CEO's job over time

This discussion concerns the perception of the CEOs about the changes in their jobs over time and this research could observe, based on the analysis of the interviewees' transcripts, that eight out of the ten CEO's interviewed affirm that the classical theory studied by the organizational behavior scholars are still present in their activities and routines and they don't see many changes in their jobs.

As mentioned previously in this study, Organizational Behavior scholars have been studying the work of executives for more than a century, according to Tonelli and Alcadipani, (2004), executives continue to perform the same kind of job and carry out the same kind of activities as those described in the classical literature an only a few changes have taken place since the classical works of Fayol (1916), Carlson (1951), Barnard (1971), and Mintzberg (1973, 2013).

Furthermore, the few changes perceived by the CEOs interviewed, is about the speed and the huge amount of information they have to deal with daily, greatly impacted by the current technological changes, which, according to the interviewees, require much more agility in their activities than in the past.

However, this perception of the CEOs has been studied by Mintzberg since the seventies until nowadays, in his studies the scholar pointed out the intense dynamic in the manager's job, the great variety on a daily basis focusing on distinct issues they have to deal with. Mintzberg added that there are no tangible mileposts where work is finished and managers are perpetually preoccupied and their activities are characterized by brevity, variety, and fragmentation and

they are always focusing on distinct issues. Mintzberg's arguments make this work believe that this change perceived by the CEOs interviewed may have been the same perceptions that others CEOs have had in the past.

On the other hand, one of the interviewees agreed partially with the classical theory, however he mentioned his difficulty in planning and controlling, according to him planning it is much more a matter of anticipation, and it is not possible to control in the midst of so much information provide by fast-moving technology.

And another interviewed believe that this classical theory is changing, according to this CEO what used to be called control today is empowerment, planning today is prototype. This CEO also suggests that the process today is based on trial and errors attempts and calling attention that is possible to make the same mistake twice.

As the majority, eight out of ten of the respondents fully believe on the presence of the classical theory in their jobs, with few concerns about the new way to deal with them nowadays, and another believes partially on the presence of the classical theory, this study did not deepen to obtain theoretical lenses that corroborate the statement of this last interviewee.

Finally, this research could observe that most CEOs perceive that management principles studied by organizational behavior scholars are still present in their routines and they do not see many changes in their jobs. Furthermore, they believe they have nowadays a new way to deal with the management principles, new manners to implement, greatly impacted by the current fast-moving technology, which require much more agility in their activities than it the past. However, Mintzberg's studies, mentioned previously in this section, make this research believes that these few changes perceived by the CEOs interviewed, greatly impacted by the technological evolution, may have been the same perceptions that others CEOs have had in the past.

5.4   The automation, computerization and surveillance processes require regulation

This discussion is about the impact of technology on the CEO's job, more specifically Zuboff's studies, where she affirms that: (1) Everything that can be automated will be automated; (2) Anything that can be computerized will be computerized; and (3) All digital applications that can be used for surveillance and control will be used for surveillance and control.

As mentioned in the results section, the interviewees' answers were unanimous in saying that this phenomenon is in an advanced stage in their organization as well as in the CEO's job,

they also mentioned how these processes, especially surveillance, are impacting their activities. The CEOs are impressed by the relevance of Zuboff's theory and how it is in advanced stage on their organizations as well as on their jobs.

In order to better understand Zuboff's studies, this research have found support in Kallinikos (2008) the scope of this study, where he affirms that Zuboff's great contribution on the work implications associated with the extensive involvement of information technology in organizations is still very relevant, even thirty years after the launch, In the age of the Smart Machine, the central themes of the book are equally or even more relevant today.

It was also noted by the research the polarized way in which the CEOs see this phenomenon because, on one hand, the phenomenon of surveillance brings a lot of information about habits and customs of consumers, which benefits their business and the quality of services provided by their companies. On the other hand, it brings a sense of loss of privacy in the whole society and the implications that this can generate.

Regarding the loss of privacy, this study observed in the previous chapter that CEO's are extremely worried with that fact. In search of theoretical support that addresses the loss of privacy, this study found in Zuboff (2019), The age of surveillance capitalism: The Fight for a Human Future at the New Frontier of Power, where she criticizes behaviorism and surveillance for suppressing our sovereignty of self, which are, in some extent, the same concerns of the CEOs interviewed for this research.

Furthermore, the CEOs interviewed are concerned regarding the lack of regulation to deal with the automation, computerization and, mainly, surveillance processes; what finds room in Zuboff's last book, where she argues that technological companies, such as Google and Facebook, are insisting that their technology is too complex to be legislated. She added that those companies have been spending billions into lobbying, while building empires on publicly funded data, and details of our private lives, rejecting established norms of societal responsibility and accountability.

Finally, the CEOs interviewed recognize that the automation process is decreasing the need for human work and are concerned that many people qualified to do manual jobs will not be able to be employed in the near future. However, this is not the object of this study, but it certainly makes room for future research.

5.5   Enterprise Social Media requires regulation

This discussion is about the impact of technology on the CEO's job, more specifically Leonardi's (2013) studies on enterprise social media, where he defines this subject as a digital platform upon which social interaction occurs rather than functioning as a channel through which communication travels, he also contrasts it to the physical platforms of offices, conference rooms, and hallways that have traditionally been the stages on which most workplace communication is played out, and emphasize that now anyone in the organization can participate at any time from any place.

As mentioned in the results chapter, the interviewees' answers were unanimous in saying that this phenomenon is in an advanced stage in their organization as well as in the CEO's job, they also declare that this theme is on the CEO's current decision-making agenda.

Furthermore, most of the CEOs interviewed, eight out of ten, see it with concern, mainly related with the possible loss of control of their companies' confidential and strategic information's and their difficulties to control what is published by their employees in social medias, inside and outside the organization where all employees can expose their points of view, often without any organizational filter.

Leonardi and Vaast (2017), support the concern of the interviewed CEOs, they affirm based on their research that unlike most large-scale communication technologies implemented within the organization (eg, e-mail, intranets, etc.), social media have, so far, regularly bypassed the organizations' IT department. Regular workplace managers and executives, without a link to IT department, are making decisions to implement social media in their division, department, and teams.

This research noted that, just as in the discussion about the surveillance process in the previous chapter, CEOs are asking for regulation in the use of social media by employees when they mention matters relating to the companies they work for and the environment in which they operate, what could impact the perception of the organization's image.

This research also noted that CEOs are already taking steps to implement the General Data Protection Regulation (GDPR) to comply with the law that will be soon implemented in Brazil. However, the CEOs warn that (GDPR) regulates the use of customer data, but not what they are asking for, which is regulation regarding the use of internal and external social media by employees.

However, it is important to mention that the perceptions of CEOs on enterprise social media are not just about concern. Two out of ten CEOs interviewed, perceive this phenomenon

favorably, according to them, it is facilitating and increasing their productivity and their connection to the market place. This positive CEO's perception is supported by Leonardi's (2013) studies, where he emphasized the powerful effects that enterprise social media can exert on the ways organizations connect with customers and stakeholders, exploring issues linked to marketing, branding, and customer relationship management.

Finally, it is important to mention the interviews were conducted from August to November 2019 and right now organizations and CEOs are dealing with enterprise social media in an unprecedented scale, in order to prepare their organizations to deal with the coronavirus pandemic.

6 FINAL CONSIDERATIONS

In this chapter, the conclusions of this thesis are presented, seeking to answer the questions and the research objectives based on a synthesis of the results and discussion, as well as the research limitations, the suggestions for future research and the practical application of this research.

6.1   Conclusions

The present study sought to contribute with the comprehension of the impact of technology on the CEO's job. The relevance of the thesis is justified by the topicality of this theme and the implications it could promote in the business environment, organizations and mainly in the CEO's job. It is worth mentioning that technology in the context of this study is mainly the processes of automation, computerization and surveillance, in addition to the use of social media in the workplace.

The objective of the research was to identify the perceptions of CEOs about the following themes: (1) The CEO's perception of the impact of technological changes in their skills; (2) The CEO's perception of the skills of an effective administrator; (3) The CEO's perception of the changes in the CEO's job over time; (4) The CEO's perception of the stage of automation, computerization and surveillance processes; and (5) The CEO's perception of the stage of Enterprise Social Media in their organizations.

To this end, this study sought answers to both the central question: Will the current technological changes require new skills from CEOs? and the sub-questions that can be seen in Appendix B of this thesis.

The CEOs, unanimously, responded that technology requires new skills for the performance of the CEO's job. Although not asked what this skill would be, CEOs understand that the ability to be in constant learning is the most required, mainly due to the fast-moving technological changes in the business environment.

When asked about the skill most required of the CEOs, based on the concept of Skills of an Effective Administrator, Katz (1974), where the author defines technical, human and conceptual skills, as the most important for leadership activities; seven out of the ten CEOs interviewed responded that human skill is the most required for the performance of their activities; while the other three interviewed responded that it is conceptual skill, but they also mentioned the importance of human skills. Although some of the current components of the

technological revolution require some level of technical knowledge, such as artificial intelligence and big data, none of the CEOs interviewed understood that they have to improve any technical skill to deal with the new technological era.

The CEOs interviewed understand that the classical managerial theory, studied by Fayol, Mintzberg, and Tonelli and Alcadipani, among other organizational behavior scholars, are still present in their activities and they do not see significant changes in their jobs. They mentioned some adaptations needed to meet the new business environment, especially those aimed at meeting the high speed and the huge amounts of information brought about by the fast-moving technological changes.

The CEOs were concerned about the processes of automation, computerization and surveillance, studied by Zuboff. According to them, despite bringing information that benefits their business and the quality of services provided by their companies, they said it brings a sense of loss of privacy in all of society and for that reason they are calling for urgent regulation, especially regarding surveillance.

Furthermore, the CEOs interviewed were also concerned with the growing automation process, which in their view will massively decrease jobs. However, as this is not the focus of this study, this question was not explored further with the interviewees and perhaps this is a relevant aspect for future research.

Finally, about the use of social media in the workplace, studied by Leonardi, the CEOs interviewed see it with concern, mainly related with the possible loss of control of their companies' confidential and strategic information and their difficulties to manage what is published by their employees on social media, inside and outside the organization. For that reason, they are also asking for regulation in the use of social media.

6.2   Research limitations

One of the limiting factors of this research was the small number of respondents, because even though the ten CEOs interviewed represent some of the most relevant organizations in their sectors, we cannot say that the perceptions revealed by this study represent the majority of CEOs in activity in the country. Thus, the conclusions of this study should not be taken for absolute truth, only a quantitative study with a more robust sample could state with greater precision that these are the average perceptions of CEOs in Brazil.

The difficulty in obtaining an hour-long scheduled interview, in person, was one of the reasons for the low number of interviewees. Another limiting factor refers to the fact that all the results presented in this research were based exclusively on the perceptions of the interviewees; therefore, because it is a qualitative research, based on an exploratory nature and from an interpretive perspective, the information obtained certainly contains interviewee bias.

Another possible bias to consider is that of the author of this work, who due to participating in the top leadership of organizations for more than a decade, also has his opinions on the topic. However, the principle of impartiality prevailed during the interviews, transcriptions and data analysis.

Moreover, the executives selected for the interviews were all chosen because they are active in traditional sectors, regardless of nationality. It is worth remembering that of the ten interviewees, seven are Brazilian, two are Chinese and one is French; all of whom are leading operations in the national territory and some also in other countries. In this way, there may also have been some cultural influence in this research, but when analyzing the results, there was no evidence of this in the answers.

6.3   Suggestions for further research

This study contributed by revealing the CEO's perceptions about the impact of recent technological changes in the CEO's job, especially if this impact will require new skills from CEOs. The author understands that there is room for studies of a quantitative nature that evaluate the CEO's perceptions, with a larger number of interviewees and with possible stratifications, such as social, economic or geographical. These quantitative studies could contribute to a greater understanding of the CEO's activities.

Another aspect revealed by this research was the concern of most CEOs with the breadth of the automation process, its immense presence in the market and the impact of this phenomenon on the future of the labor market, which in their view will massively decrease jobs. However, this was not the object of this study, but it certainly makes room for further research on this topic.

Finally, the CEOs interviewed in this research placed huge emphases on the processes of surveillance and the use of social media in the workplace as well as the need for regulation concerning these two topics. These are very relevant topics for CEOs and should certainly be researched in greater depth, either through the qualitative or quantitative approach.

6.4   Practical applications

I have been working as an executive for more than fifteen years and I have twenty plus year career, ranging from a family owned company to multinational giants, with an Executive MBA, a postgraduation in Business Management and a certificate in Marketing. Taking that into account, this study was first of all a personal desire of the author for the following reasons: (1) To have an academic point of view of my area of expertise; (2) to prepare for a possible career transition into academia and consulting in the future; and (3) personal recognition.

That said, as expected in the scope of the Professional Master's in Administration, the practical application of this study is to contribute to the comprehension of the CEO's job; it is relevant to mention that CEOs were the group studied for methodological reasons, but what was discussed in this thesis can be applied to executives in general.

Thus, the greatest takeaway from the experience in developing this research, is the perception of all CEOs interviewed: we need to be in constant learning, either in courses, forums, lectures or executive education. They added that we have to pay attention to the transformational moment we are in, realize the unprecedented challenges our businesses are facing and try to predict what our businesses are going to be like in the near future.

Alternatively, what I can say about my experience as a senior executive and a junior scholar is that we need to pay attention to what we are choosing in constant learning, because we can find many options in courses about leadership, but not enough about the political map inside organizations. This thesis brought the following to my attention: the largest concerns of today´s CEOs are how to deal with surveillance and social media within the workplace and how to regulate it; none of these subjects have received sufficient attention in comparison to the traditional subjects taught in business schools, consulting firms and the like.

Finally, it is important to mention the topicality of this thesis's subject supported by two distinct facts. (1) The cover story of one of the most renowned magazines in the world, The Economist, published on February 8, 2020 under the following title: Meet the new boss: What it takes to be a CEO in the 2020s and the story itself has the following title: The rules of management are being ripped up: CEOs need to adapt; (2) One of the themes discussed in this thesis is the impact of enterprise social media on the CEO's job, and they are certainly dealing with it right now, due to the unprecedented number of people working remotely, in order to stay safe from the Covid-19 pandemic.

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APPENDIX - A - Interview Script:

Introducing the interviewer and participant interviewee;

Overview of the purpose of the study;

Confidentiality assurance;

Permission to record the interview;

An introduction about the research theme and the theoretical background;

Start asking the questions as specified in the questionnaire;

Ask the interviewee if he or she has any doubts or anything to add;

Interviewer will explain the next steps and the project's timeline.

APPENDIX – B - Questionnaire:

Central question:

Will the current technological changes require new skills from CEOs?

Sub-questions:

Is the classical managerial theory: forecasting, planning, organizing, coordinating, commanding and controlling, still on track in our routine? How are they in your routine nowadays?

What is the difference in your job today compared to ten years ago?

Regarding the Robert Katz (1974) three skills approach: technical, human and conceptual; which of these skills are more required in the CEO´s job nowadays, considering the current technological changes?

Considering technology as a technical skill, do you think technological skills will be more essential for CEOs?

Do you feel prepared to keep working as a CEO with no specific improvement in your skills?

Do you think any of the technological issues like the internet, social media in general, big data, artificial intelligence and robotization are requiring new skills from you? Which of those have more impact in your routine?

Based on the Shoshana Zuboff statement: 1) Everything that can be automated will be automated. 2) Anything that can be computerized will be computerized, and 3) All digital applications that can be used for surveillance and control will be used for surveillance and control. In your opinion, in which stage is this process in the workplace and in your company?

Based on the Paul M Leonardi statement: Rather than functioning as a channel through which communication travels, enterprise social media operate as a platform upon which social interaction occurs. Because this platform is digital, in contrast to the physical platforms of

offices, conference rooms, and hallways that have traditionally been the stages in which most workplace communication is played out, anyone in the organization can participate at any time from any place. Do you communicate with your employees by using social media? In your opinion, which stage is this process in the workplace and in your company?