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# Robotic Process Automation: Business Model

## Robotik Süreç Otomasyonu: İş Modeli

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### ABSTRACT

The inevitable reality in the business world is that it is constantly evolving. The main driver of these changes can be found in the continuous search to acquire a competitive advantage. The company that is capable of providing the most efficient solutions to the needs of its clients is the one that will find itself capturing the market. The search for efficiency has become a race to transfer transactional activities to machines that can perform them quickly and with a minimum of errors, freeing up people's time so that they can focus on activities of a strategic nature; harnessing human creativity to improve business, instead of occupying them in repetitive activities.

**Keywords:** Robotic Process Automation (RPA) , Automation, Business Process.

### ÖZET

İş dünyasının kaçınılmaz gerçekliği, sürekli gelişiyor olmasıdır. Bu değişikliklerin ana itici gücü, rekabet avantajı elde etmek için sürekli araştırmada bulunabilir. Müşterilerinin ihtiyaçlarına en verimli çözümleri sunabilen firma, kendisini piyasayı ele geçirirken bulacaktır. Verimlilik arayışı, işlem faaliyetlerini hızlı ve minimum hatayla gerçekleştirebilen makinelere aktarmak için bir yarış haline geldi ve insanların stratejik nitelikteki faaliyetlere odaklanabilmeleri için zamanlarını serbest bıraktı; Tekrarlayan faaliyetlerde bulunmak yerine, işi geliştirmek için insan yaratıcılığını kullanmak gereklilik olmuştur. Bu makalede bu gereklilikler incelenecektir.

**Anahtar Kelimeler:** Robotik Süreç Otomasyonu (RPA), Otomasyon, İş Süreci.

### INTRODUCTION

The latest wave of technological innovation focused on automation has reignited the debate - both academically and professionally and in the general public - about the effects it will have on the world of employment and human labor. This debate is certainly not new, but originates with the industrial revolution and has resurfaced with each cycle of the emergence of new fundamental technologies, steam, electricity, information. On the pessimistic side of the debate are those who predict a net reduction in the demand for labor, with the consequent unemployment and reduction in wages. On the other side, the optimist, there are those who argue that technological changes have always resulted in a benefit for the labor factor and that at least in the long term the same will happen this time (Lin & Weise, 2018). But even those who view the long term with optimism, recognize a certain degree of uncertainty, since the recent technological waves, based on robotics, information technology and Artificial Intelligence (AI), represent a type of technological progress unlike anything else. that has been seen before.

Among the novel elements that can be appreciated today is the incorporation of new technologies in tasks that previously required higher cognitive levels and that are not very repetitive, which is why they were assumed to be exclusively for people, even with technical or professional training. Added to this is the fact that the improvement experienced by these technologies has been extraordinarily accelerated and persistent, largely thanks to what is called the

Digital Revolution (Brynjolfsson & McAfee, 2012). Already in the past and especially in today's developed countries, the massive incorporation of technology into production processes generated a displacement of human labor from productive sectors - including agriculture - to services. The contemporary wave of changes began to take shape when technologies began to perform tasks in the service domain with increasing efficiency.

Associated with this, it is evident that in some areas the available jobs have become polarized, concentrating on the one hand among those that subsist because they remain below the level in which it is efficient to invest capital to automate (elementary occupations) and, on the other, among those in which the level of specialization and cognitive is high enough to be outside the capabilities offered by the current level of these technologies (Gallipoli & Makridis, 2018). Examples of the former are home delivery workers, construction laborers, warehouse assistants and supermarket replenishers. Although tomorrow it is also likely that the massification of technology due to scale effects will gradually make them disappear, just as at the time it happened with elevator operators, telephone operators and typing machines. However, there are occupations that due to their particular characteristics will tend to remain in a longer period of time among the non-automated ones and that in relative terms have been favored by the polarization process: they are personal services, which are jobs that involve attending or caring for from others, such as nurse aides, food preparers, security guards, building maintenance managers, cosmetologists, and hairdressers (David & Dorn, 2013).

As for jobs with high qualifications and cognitive requirements, most of the liberal professions are examples, such as engineers, doctors, lawyers and architects, all of these increasingly require complementing with advanced technology to perform adequately, but it is considered that the essential of their rating is not threatened in the short term. The most recent advances in Artificial Intelligence, however, although they do not aim to replace the professionals themselves, they do already carry out some of their tasks that were considered exclusively human heritage, since they need specialized cognitive capacities, such as medical imaging diagnosis. (Paiva & Prevedello, 2017) or the design of complex structures in engineering (Salehi & Burgueño, 2018).

The effects of the process of change and displacement of work are experienced differently not only according to the educational or socioeconomic level to which those affected belong, but also vary according to gender. It is observed that women, on average, perform more routine and codifiable tasks than men, in all sectors and occupations, which is why they tend to be the first to be displaced by automation. Similarly, women tend to be underrepresented in the Science, Technology, Engineering and Mathematics sectors, which coincidentally are those with the greatest complementarity with the development of new technologies and where more opportunities for new jobs are generated (Brussevich et al. , 2018).

The speed of substitution of human labor for automated systems is also affected by demographics. On the one hand, it is expected that by 2050 about a third of the world's population will be over 50 years of age, an indicator that only covered 17.5% of the world's population in 1950. On the other, according to published analyzes, these people from more than 50 years have great

limitations when carrying out complex tasks with the participation of technology, being widely exceeded by people of lower age ranges. This is consistent with recent studies (Acemoglu & Restrepo, 2018c) suggesting that the older the population of a country, the greater the acceleration in the adoption of automated systems. The latter would explain why, in relative terms, countries such as the United States and the United Kingdom are lagging behind in industrial robotics compared to Germany, Japan and South Korea, where the rate of aging is higher.

There is consensus, therefore, that human work, for better or for worse, is undergoing a profound transformation, which will be accentuated in the coming decades and which will have an equally important impact on the structure of all societies. Due to its importance, this phenomenon is being approached from different points of view, the sociological, the psychological and that of the productive agents, pre-eminently, those who try to size it, predict its evolution and remedy the problems that derive from it. To study this phenomenon from the point of view of the economy, at the country level, and try to predict its development and impact at least in the near future, it is necessary to formulate models that incorporate the economic cycle as a whole, with all the elements that form part of.

The growing anxiety of economic agents, governments and people in general in the face of observable evidence of changes in the labor market and the transformation of employment associated with the development and dissemination of new technologies, has led to studies aimed at predicting which and how many jobs and professions will be at risk of being displaced or transformed. Frey & Osbornme (2017) proposed a model to estimate how susceptible current occupations are to technological advances that have occurred in recent years, assuming that as a consequence of advances in Artificial Intelligence, practically any task whose execution could be specified as a structured procedure. Under this assumption, they concluded that 47% of employment in the United States had a high risk of being automated. However, subsequent studies led other authors to consider that these values are overestimated, because when making a more comprehensive analysis of jobs, not restricted to the automatable portion of their tasks, it is concluded that it also contains many others that are more difficult to automate.

New studies that took these factors into account led to a reassessment of jobs that could be lost due to being automated is only around 9, but while recognizing that many of the individual activities they involve are occupations, 2017 var otomatikleştirilebilir bir temel de la güncel technology, tending bir çeşit substantially the way work is done towards a belediye başkanı interaction between people sees machines or people and systems.

In short, the loss of jobs may well be an intermediate number between the two extremes of 9% and 45% that the studies mention, since the automatable tasks of various jobs tend to be organized as coherent units, regardless of the organization of tasks. performed by humans, concentrating functions sees activities previously assigned to several people Brynjolfsson et al. (2018). Likewise, this loss may be

Certainly some people will be displaced from their job by automation, but the general economic growth induced by it will allow them, sonuçually, to find another. The effect, benzer bir şekilde üretilirse, emeğin gözetiminde, especially in the USA, from agulture and that generated to other sources of employment generated, sees different that to a large extent had not been foreseen

(Manyika, 2017). Other cases, what will happen is that people will face a substantial transformation of their jobs, being necessary for employers to carry out a reengineering of processes sees a reorganization of tasks. Investors, managers see entrepreneurs should focus their attention not only on automation but also on job redesign.

The disturbances to the well-being of people generated by the process of transformation of labor markets in çok satan çözümler yaratıcıları see multivariate, in iyi see in çok kullanılanlar, sometimes tentatively and deneysel. These solutions, on the one hand, the re-study of the educational, training and qualification schemes of current workers sees future workers (Bravo, García & Schlechter, 2018). People will necessarily have to get used to working in increasingly automated environments, living with advanced machinery or robots, they will have to develop new skills that are demanded in that environment.

"Basic Universal Income" see "Basic Universal Income" için birleşik olarak, sosyal, sosyal ve programların yanı sıra çeşitli koruma programları increase in employability and support for emek retraining. All these solution strategies are equally valid for developing countries, where tartışmak is already installed, but its implementation will possibly be deferred in time.

The process of transformation of work is part of the development of the world economy, highly globalized, where there are multiple development poles, each with its own dynamics but with a high level of interdependence between them. The primary factors that move these Economies continue to be capital and labor, but what ultimately seems to be at stake is the relative participation of each, where some see that in certain sectors the labor factor is threatened to decrease in importance to almost disappear.

The engine of the transformative process in the üretim of goods and services is the productivity ve gerekli olan in önemli kaynaklar, which only varies in the necessary amount of the ekonomies that have generated a sufficient level of wealth. Bu nedenle, motivasyon ve teknolojinin benimsenmesi ve otomatik olarak benimsenmesi için ilk önce, daha fazla ekonomi, where productivity was already belediye başkanı, with which the result is that the productivity gap tends to widen, increasing inequality in economic development occurs nations first in these more developed economies (Zeira, 1998).

The existing analysis models, for the reasons noted, have been preferably applied to already developed countries, where technological innovation is permanent and accelerated. Considering the high degree of interdependence of the economies, resulting from the growing globalization process that has occurred in recent decades, the economies of emerging countries, particularly those of Latin America, although they show a relative delay in terms of production automation, are indirectly affected due to investments in automation and robotization made by developed countries, which differentially increase their productivity in segments where developing countries previously exhibited comparative advantages due to lower labor prices (Micco et al., 2019).

The objective proposed in this article is to apply these models in an economy such as Chile, which has an intermediate level of development, which is very vulnerable to fluctuations in international markets and highly dependent for its development on investment flows. from abroad

and showing very dissimilar sectors in terms of capital investment, their degree of automation and productivity.

## 2. RELATED LITERATURE

Automation processes have been approached from different approaches, taking into account the effects they generate, rather than their causes. An important reference for the development of this study has been the work of Lin & Weise (2018). The development of his research postulates a three-factor analysis model, where he separates from “traditional” capital, which is complementary to human labor, from “robotic” capital, which is defined as a net substitute. These three factors - labor, robotic capital, and traditional capital - are combined into a nested CES (constant elasticity of substitution) production function.

Capital being a net substitute for labor, its accumulation reduces the net contribution of labor to production and may also result in a net reduction in wages. But this model, in addition to taking this effect into account, also incorporates two channels in which this trend is indirectly counteracted. The first is that the introduction of new machinery to the production process increases the marginal product of complementary types of physical capital, which induces the incorporation of investment in traditional capital, which is complementary to human labor, which consequently tends to increase labor participation. . Second, robots in the model use the same production function as capital and consumer goods. This causes an investment in robotic capital to increase the demand for human labor to be used as an input in its own production.

The complementarity and substitution of factors that consequently produce a displacement and production effect has been widely studied by Acemoglu and Restrepo. Specifically, the work by Acemoglu & Restrepo (2018a) uses an analysis model that emphasizes the effect of the shift from human to automated work, which reduces the demand for work and wages, but has a productivity effect as a counterpart, resulting cost savings from automation, which increases the demand for work on non-automated tasks. The productivity effect is complemented by an additional accumulation of capital and the deepening of automation through the improvement of existing machinery, resulting in a further increase in the demand for labor. But despite these effects, automation increases individual production more than wages and reduces the share of labor in national income.

The usual approach starts by establishing production functions that consider capital and labor as the fundamental variables. In this case the authors opt for a different approach, where the basic productive unit is the "task" and each task requires either only work or labor and capital. The variables work and capital also present comparative advantages for the execution of tasks, so that the productivity of work varies according to the different tasks. From this approach, automation is conceptualized as the expansion of the set of tasks that are executed with a capital component. Depending on whether the price and the marginal productivity of capital are adequate, the substitution of capital for labor can be observed in these tasks, causing the displacement effect.

Within an analysis framework in which the production process is broken down into tasks, Acemoglu & Restrepo (2018b) show how the role played by changes in the content of tasks of a

process, due to automation, can be empirically observed. A production process involves several tasks that can be performed both by human labor and by a machine or software, that is, by capital. Automation allows those tasks carried out by humans to now be carried out by means of capital, reducing the demand for labor. This distribution of tasks to productive factors is called "task content of a process" for a specific activity.

Over the years, this effect is counterbalanced as a result of the appearance of new tasks that emerge as necessary, such as the case of specialized personnel to maintain robots. In this way, automation processes and advances in industries have given way to the creation of new occupations and an increase in the demand for human labor. A clear example can be seen in the digital era that erupted at the end of the 20th century, which has driven the creation of new jobs, such as creators of web sites and applications, programmers (and hackers), network security controllers, analysts of social media, web optimization and digital marketing, all of them specializing in a wide range of tasks that were previously non-existent. Acemoglu & Restrepo (2018b) call it the “reincorporation effect”, that is, the labor factor is reincorporated to a wider range of tasks, changing the content of production tasks in favor of employment and with this increasing the participation of work and labor demand. This distinction of tasks also makes it possible to make an assumption regarding the technologies that increase capital or labor in the production function Yt = F (AkK, ALL), since it assumes a uniform increase in productivity in all tasks and is not distinguished by specific tasks.

A convenient methodology has been the creation of meters or indices that allow knowing the degree of automation by industry. This has been the work of Acemoglu & Restrepo (2017). Using a model in which robots compete against human labor to perform tasks, the authors show that advances in robotics technology can reduce employment and wages and that the impact on the local job market can be estimated by regression. of the variations of these factors using an index of exposure to robots in that market.

The robot exposure equation is composed of a base employment share multiplied by an adjusted robot penetration rate (APR) for a given industry i. This makes the robot exposure measurement similar to a Bartik instrument. This instrument was originally used to measure the growth rate of local employment, interacting the participation of employment at the local industry level with the growth rates of employment at the national industry level. The data used by Acemoglu and Restrepo belongs to the International Federation of Robotics (IFR) for 50 countries from 1993 to 2014, which includes stock of robots by industry, country and year. These data, of a reserved nature, are complemented with those obtained by EUKLEMS for the creation of the index.

An alternative frame of reference, also developed by Acemoglu and Restrepo (2018d), consists of differentiating automation according to the level of job qualification required by the tasks they replace. The motivation for this arises from the recognition that the most recent innovations of Artificial Intelligence generate technologies that automate increasingly complex tasks and of a cognitive level in the range of high-level skills, which were previously limited to human work, protected by an insufficient degree of advancement in automation technologies and robot capabilities.

The objective in this case is to propose a model that allows a different study of the effect on the labor market of the two types of automation technology, extending the traditional substitution

models and establishing a broad scheme of comparative productivity advantages for tasks that can be carried out advantageously. either with work or with capital (automation) and that include activities that require a high level of qualification. The model shows that both types of automation create the two types of impacts: the displacement effect and the productivity effect. The displacement effect reassigns tasks from labor to capital, with the consequent reduction in demand and wages, while the productivity effect tends to increase demand and income for both factors. The net effect produced depends on which is the dominant effect, which in the long run turns out to be the productivity effect. The intuitive reason for this is due to the fact that in the short term, the demand for capital that is increased by the potential advantages of using it to replace work -capital that is cheaper in relative terms at the beginning- ends up becoming more expensive due to the increase in demand, which spoils the potential increases in productivity that were expected, on the other hand, in the long term the price of capital is stable, with the expected increases in productivity having an effect.

A specific investigation in the field of tasks that require high qualification was carried out by Frey & Osborne (2017), who investigate how susceptible Other authors propose models that introduce variations and effects to take into account aspects that were overlooked in previous studies in order to refine the results or expand the scenario analysis. Berg et al. (2018) introduce two key assumptions: that robotic capital is different from traditional capital in terms of the degree to which human labor is substituted, and that savings only occur among highly skilled workers and among owners of capital. Based on this, they elaborate variants that ratify the boost to income derived from automation and the negative effect on equity. Workers' incomes tend to decline in the short term to recover later in the long term, but the time elapsed before recovery can be excessively long.

The rapid development of Artificial Intelligence technologies also introduces other potential impacts that need to be taken into account in the studies, introducing variations in the models. The economic growth induced by new technologies needs to be projected by introducing considerations at the level of the organization of the companies and the structure of the markets. Some consider that the disruptive potential of these new technologies will be much greater than that foreseen in the models, as the very process of generating new ideas and technologies will be fed back by themselves, potentially creating technological singularities (where some systems exceed human cognitive capacities) that potentially generate changes of unprecedented magnitude in the evolution of the economy. A study by the National Bureau for Economic Research (Aghion et al., 2017) speculates in this regard, showing the potential to find unexpected effects and proposing various scenarios for future analysis.

In addition to the direct effects on employment and benefits in terms of higher productivity, where most studies are focused, Artificial Intelligence technologies present benefits and opportunities that go much further. More and more companies will be able to improve quality and adjust their products to the convenience and satisfaction of consumers. AI can reduce the time people spend on low-value tasks and streamline the consumption process, all of which increase the demand for the goods and services produced.

A study by PwC (2018), by incorporating the perspective of the effects on consumption, sought to present a clearer picture of the global economic potential of AI technologies, exploring the consequences of the increase in the value of work and productivity beyond of the substitution of capital for employment. The study also made it possible to differentiate geographically and by sectors the relative distribution of the impacts of the diffusion of these technologies. The model concludes that North America and China are the regions that will obtain the highest percentage of economic benefits from Artificial Intelligence technologies, both in the first place due to their leadership in research, and in the case of China, due to increases in productivity, while that in the USA the impulse is provided by the remarkable disposition to innovate and the speed of diffusion of new technologies, either by way of replacement or increase.

An IMF study (Peralta-Alva & Agustin, 2018) carries out an analysis focused on the automation factors and the fall in the prices of capital goods, identifying them as the key factors that affect future growth and the evolution of inequality . The automation factor is defined as an increase in the elasticity of substitution between capital and labor. To illustrate the impact of both factors, they use a dynamic stochastic general equilibrium (DSGE) model. The model is based on two key ingredients: first, the economy produces three different goods: manufacturing, low-skill services, and high-skill services (low-skill and high-skill). Second, consumers have non-homothetic preferences for these goods, reflecting the increasing share of spending on services when income grows, characteristic of US data.

**2.1 Transformation from the industrial revolution 1.0 to 4.0**

According to the Dictionary of the Royal Academy of the Spanish Language (2019), the word revolution means a rapid and profound change in anything. Therefore, the revolutions that have arisen and that have been provoked throughout humanity have brought with them various iconic stages in the transformation of the world, which has especially impacted the economic, social and communicative spheres of people. History shows that to reach the 4.0 revolution, there were three stages that preceded it. Where, even before the beginning of these stages, the human being goes from being a nomad to becoming sedentary and a producer of his own inputs and products for survival. Added to this, the artisan way of making the same products. Until, many years later, the first industrial revolution appears.

For Klaus Schwab, (2016) this spanned from 1760 to more or less 1840, although its origins could be earlier. Crucial moment for man where the generation and creation of new inventions begins to emerge, such as the introduction of James Watt's steam engine in the industry of Great Britain, the construction of the railway and many other inventions that led to the creation of various factories and near them began to inhabit conglomerations of people who attended the demanding labor needs at that time. Years later, these places would be called cities. The second industrial revolution, arises between the late nineteenth and early twentieth centuries, here appear new visionaries such as Henry Ford, who promoted the generation of large-scale jobs, the so-called Fordist type. A production that was impacted by the invention of electricity, which had a profound impact on people's lives. Then came the third industrial revolution, also known as post-industrial or as the era of the computer or digital revolution. It is characterized mainly by the invention of the computer, computer science and informatics.

Accompanied by this, new digital changes that meet various needs of the people, companies and organizations of the time. "The birth of the Internet, in the second half of the 20th century, was what marked the Third Industrial Revolution, also known as the digital revolution" (Paramio and Hernando, 2019, p. 154). In the opinion of Rafael Macau (2004, p. 4), it is in the eighties, the Third Industrial Revolution, where the impact of technology is more evident for organizations, even more than was imagined and understood up to that moment by companies. large companies, achieving a strong scope when using this technology, which ranges from reducing costs for the organization, through improving information management, to supporting the organization's own management. This industrial revolution is characterized mainly because digital media transformed forms of communication. But in a special way, due to the creation of new supports where people are generators and consumers of information, especially due to the appearance of social networks. Right now, there are moments of transition between the third and fourth industrial revolutions. The latter, which began at the beginning of the 21st century and is mainly characterized by giving life to new ways and tools to communicate through the internet, by the appearance of artificial intelligence, machine learning or machine learning, robotics, biga data, blockchain, internet of things, automation and many more sciences that have been growing and possibly others that will appear in the coming years.

The so-called fourth industrial revolution is also known as industry 4.0, I4.0, digitization of production systems or reindustrialization. The term industry 4.0 was coined at the Hannover Fair in 2011 where it was described how it will revolutionize the organization of global value chains (Schwab, 2016). An Adeco study carried out in 2018 says “in reality, the fourth industrial revolution, also known as Industry 4.0, is an evolution of the digital infrastructure that we already have towards new systems” (Adecco, 2018, p. 46). This era is the passage to the knowledge and information society. Where relationships and the way of communicating change in the human being.

To better understand what Stiegler refers to with hyperindustrial society, in the review of the book "La société hyper-industrielle" by the author Pierre Veltz, which Eguzki Urteaga (2017, p. 188) mentions that it is caused by the processes of economic globalization, territorial forms of the knowledge economy, new industrialization and business strategies, which causes the super-industrial society as a representation of a new productive capitalism that society lives. Making a socio-historical review, the human being is the center of change and the transformation process experienced and now with greater force in the digital transformation. Technologies almost oblige, or in a more subtle way, invite companies to readjust their work dynamics and that implies a series of changes and adaptations. Digital transformation should be seen as a stage of business development for the company, but also for employees. For Javier Neira (cited in Portafolio, 2019) digital transformation is not only talking about technology, its meaning is broader, it is understanding the client and always improving the user experience, using technology as an ally, so that the processes attraction, retention, remuneration and development evolve and achieve their objective. New technologies are changing the dynamics of production, service and consumption processes, which makes the nature of business change as well. There are manufacturing processes in the industry that have already been automated and others that can also be automated to improve their efficiency (González-Filgueira & Rodríguez, 2018, p. 2). What has been addressed so far is a

referential framework that allows a retrospective of what happened and that is aligned with the subject under study in this article, intelligent automation in communication management.

### 2.2 The power of automation in organizations

Advances in technical developments in computer hardware and software have allowed automation to be introduced in practically all aspects of human-machine systems (Parasuraman, Sheridan, & Wickens, 2000, p. 286). This science not only replaces physical matter, but also causes changes in the activities carried out by human beings. The technological development of which we are part is linked to the automation that for Parasuraman et al., (2000, p. 287) refers to the total or partial replacement of a function, previously carried out by the human being, being able to vary the level of application, that is, if the process is light or highly automated. To better understand the concept of automation, the Royal Academy of Exact, Physical and Natural Sciences (RACEFyN) of Spain starts from the definition of the automatic, understood as the set of methods and procedures for the replacement of the operator in physical and mental tasks before Vialy programmed, therefore, automation is understood to be the application of automation to the control of industrial processes and which has evolved in many fields of science. The Dictionary of the Royal Spanish Academy (2019), derives it from the verb automate the same one that has two meanings: on the one hand, "converting certain movements into automatic or undeleased movements", and, on the other, "applying the automatic to a process or to a device ".

The definition of the Oxford English Dictionary (1860) is also rescued, when it refers that automation is the action or process of introducing automatic equipment or devices in a factory or another process or facility, or also as the act of doing something through of a system, device, etc. automatically. In addition, since the 1950s it was related to mechanical or electronic devices and allowed the substitution of people's work, which has remained until today. For Parasuraman et al., (2000, p. 287) automation refers to the total or partial replacement of a function, previously performed by the human being, being able to vary the level of application, that is, if the process is light or highly automated . In another research Parasuraman and Riley (1997, p. 231) define automation as a concept that can change over time, under the conception that automation comes from a machine (generally a computer) and where the assignments of functions from human to machine they will transfer and change over time.

For Macau (2004, p. 2) one of the first milestones that marked the history of automation is that "as of 1960, computing is introduced in organizations with the aim of automating repetitive administrative tasks (accounting, billing and payroll, mainly) "transforming the organizational processes of companies from that time to the present. The next big step, which takes place at the end of the seventies, according to Rafael Macau (2004, p. 3) is the appearance of the concept of "Management Information System (MIS), an integrated information system that, based on a design global, includes both bureaucratic work automation systems and management information systems of the different managerial levels "within an organization. For Gerardo Tunal (2005, p. 196), automation has two origins that date back to the 1980s. The first when the statesman from the United States Census Bureau, Herman Hollerith, had created a computer that was capable of classifying punched cards, duplicated and compared, being able to encode population data to

generate census statistics and the second milestone, when in 1994 Howard H. Aiken, from Harvard University, created the first fully automatic and electronic calculator, the Automatic Sequence Control Calculator (ASCC for its acronym in English, Automatic Sequence Controlled Calculator), with which it was possible to carry out continuous operations previously programmed. Inventions that at the time were highly valued due to the conditions in which they developed and technological advances, the former has even been considered a precomputer. Pablo Míguez points out Coriat's work "The workshop and the robot" where the passage from Fordism to post-Fordism is analyzed, focusing above all on the appearance of new means of work, such as microelectronics and computing, which would have led to a new wave of innovations, in the so-called "era of automation"… and what would be the first stage of automation "(Míguez, 2008, p. 3).

What is evident is an automation that has been perfected and improved over the years to become intelligent and self-sufficient technologies through technological systems and equipment.

For Bravo, Santana, & Rodón (2014, p. 269) "the essence of the automation role is related to the extent to which technology performs activities replacing the human". For Kaber and Draper (2004) cited in (Bravo et al., 2014, p. 269) they state that whoever makes the decision to automate processes and differentiate the activities that they are going to do carried out by humans and machines is the responsibility of the organization. In this same sense, Davis (1986, p. 299) states that the general managers of organizations play an increasingly important role in decisions related to the computer support that is used within them, by their collaborators.

Automation draws public attention for the economic benefits it can provide, or at least those that are perceived (Parasuraman et al., 2000, p. 286). It has freed humans from many activities, especially those that require a lot of time and physical effort. Now it is possible to make human work more productive, which increases the demand for labor (Acemoglu & Restrepo, 2019). David Autor (2015, p. 5) argues that the interaction between the machine and the comparative advantage of the human being allows computers to replace workers in the performance of routine and codifiable tasks while expanding the comparative advantage of workers in the provision of problem solving skills, adaptability and creativity, which at no time can or at least until now have not succeeded in being substituted by the human being. These cognitive functions such as decision making, planning and creative thinking are what automation has not been able to replace (Parasuraman and Riley, 1997, p. 231).

Maintaining a more critical stance, Tunal (2005, p. 100) believes that the impact of technological change in some contemporary productive organizations has been more harmful than beneficial for some social groups, and this because computers, and with it computer networks , have allowed the development of new types of relationships and capacities, not always applied responsibly. In addition, it points out that the technological impact on automation of work processes is inevitable, therefore, senior managers must have the ability to reconfigure their way of doing management. Automation is advancing rapidly, and the challenges of replacing workers with machines in tasks that require flexibility, judgment and common sense remain many, considering that, in many cases, machines replace and complement human labor.

For Bravo et al., (2014, p. 269) who make an analysis of the relationship between automation and the usefulness of information systems, state that a system can have two roles, the

first is to produce information (computerize) and the second, automating activities replacing people, and both cases apply to any area of the organization, although they add that due to the impact of technology, the one that has grown the most is the first. The digital transformation hand in hand with automation is transforming the organizational systems of companies, making them more efficient and dynamic. One of the main reasons why processes are automated in an organization is to reduce the possibility of human error, by reducing the high physical and mental workload that is demanded (Parasuraman & Riley, 1997, p. 235). Automation has allowed organizations to evolve according to their institutional background and to deploy a variety of forms complementing or linking to each other (Tunal, 2005, p. 99).

## CONCLUSION

The technological revolution in which we are immersed is changing the way of seeing and understanding the world. It moves the dynamics of communication and social interaction. Not only does it transform technological or physical aspects, it is changing deeper aspects of the human being. During this process of technological revolutions, it is the human being who has had the greatest capacity to adapt to changes and transformations and with the speed at which it grows, it will be the same man who must open his mind and engage with incalculable technological realities that even they have not yet been discovered and they portend an unimaginable future. Faced with this technological growth, organizations must have a clear vision of where to go and what is the change in corporate culture that they want to give the company by aligning its business strategy to technological, competitive, efficient and sustainable standards in such a way that they remain aligned to trends and challenges of technological change. The current reality is that digital transformation is radically changing the support or support processes of organizations. Therefore, the application of new technologies in organizations changes various fields of production and services, and organizations must be prepared for these changes. In this same sense, new technologies are a key factor in advancing the implementation of automation in the communication management of organizations; however, its momentum or stagnation may also depend on other factors internal to the organizations themselves. However, it should be clear that the value of communication allows the development of new, more participatory forms of interrelation between audiences and organizations. The automation of communication and marketing management could be considered a strong and high-value pillar for organizations, as it is a field that has emerged notably in recent years and presents a visible future and growth projection for organizations. Even regardless of the field in which they are operating. As has been seen, the state of the art of automation in communication and marketing highlights the need to generate new research. In a special way, on the role of the human being, their knowledge, their behavior in the face of the various advances in automation, the impact of automation and how the public receive these changes and the level of satisfaction they have in front of them and even know the level of interest on the part of organizations in automating certain actions within communication management, which could lead to new research from the academic field. Finally, it is considered that there are several factors that can influence the lack of success in the automation of communication management, on the one hand, the lack of a technical and real justification to automate a process, the lack of a real projection of economic investment and the lack of trained personnel to carry out the management of automated

communication. However, this does not mean that it should not be limiting to start automating communication management in organizations. On the contrary, if a correct application is achieved within organizations, it could mean and bring countless new favorable possibilities and make it more competitive and have differentiating elements that make the difference between brands. Therefore, the future projection of automation in the field of communication could be of high impact.

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