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INDUSTRY 4.0 IN BRAZIL

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ABSTRACT

This article deals with a new industrial revolution: Industry 4.0. It is an industry concept proposed recently, mid-2011, which began in Germany. This movement encompasses a new way of producing new, highly integrated and automation-intensive digital processes. China and Germany are now emerging as pioneers in the research and deployment process in their industries. They make parts of the new technologies cyber security, internet of things, autonomous robots among others. In Brazil this new model is happening slowly but there are expectations of growth due to the support of financial and multinational institutions installed in the country. Industry 4.0 is already bringing major transformations to industries, products, services and consumer behavior. One of the great current impacts is on the replacement of human labor by artificial intelligence, causing changes in the professions and impelling the emergence of some and adaptations of others. It is the policy of government and society in general, to establish structures and activities that facilitate access to the new concept. The first three industrial revolutions characterized by the technological competition of the development, being that the fourth revolution encompasses the fusion of the physical, digital and biological world.

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INTRODUCTION

Industry is currently undergoing another revolution that can significantly alter production systems. Industry 4.0 calls for intelligent sources, extensive use of robotics, reliable systems for processing and storing data. All this integrated aiming to properly use resources and procedures to increase productivity and ensure the quality of the joints obtained. What can not be forgotten is that behind all this technology there are years of research and development. All automation, embedded electronics, software development and dedicated systems only translates into sustainable advancement that justifies the name of revolution if the much-publicized results can be systematically obtained. This will only happen if we continue to take advantage of every breakthrough revealed in the form of search results, available for example in periodicals of proven quality in the area. Proper use of knowledge can make the difference between a successful technological revolution and the monumental ability to multiply an error with the help of the most advanced technology available. The availability and use of information is only productive when this information comes from reliable sources.

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Iniciatives of the companies installed in Brazil

More than its position in the world ranking, the countries that lead the current wave of industrial innovations also compete for the profile and configuration of the new technological paradigm, composed of new parameters, criteria and protocols. The intense participation in this competition from countries such as Germany, the United States, Japan, Korea, France and China, to name only the most aggressive, suggests that the next ten years will be critical for defining future industry traits and selecting patterns which will prevail in the second half of this century. Exactly for this reason, Brazil, in spite of all its difficulties and needs, must prepare itself not to be marginalized from the process of consolidation of the new digital industry, as was the case with the explosion of microelectronics, computing and information and communication. The later the reaction, the greater the distance

from the more dynamic and larger companies will be the obstacles to be overcome in order to reposition the Brazilian industry. The systematization of what the three countries surveyed do in a similar way can help define drivers for the elaboration of a Brazilian advanced manufacturing strategy. JHON DEERE presents a remote monitoring solution for operations, from the internet connection, through the access of information through laptops, tablets and smartphones. Technological adoption has its origin in the ability to collect, send and process information, making it possible to improve availability to the machine's performance and production costs (MARKETING INDUSTRIAL, 2016). In relation to STARA, it adopted an unprecedented worldwide technology, the Telemetry (measurement and communication of information) to the information management, for the amplification of the production, reduction of wastes and costs of production. It is also possible to monitor in real time any mobile device, establishing a safer and more efficient operation. The launch took place at Agrishow in 2016, and the technology was developed in partnership with the internal R & D team, SAPLabs Latin America - São Leopoldo collaborators and technical and scientific students (STARA, 2016).

At YARA BRASIL FERTILIZANTES - focuses on business digitization, where it reaches hyperconnected clients, acting in a vertical manner. This meets in a way the requirements of the new scenario with the development of creative and innovative digital solutions, in some cases pioneering in the area of performance. Yara won the IT Leaders 2017 award in the agribusiness category, which reveals the considerable increase in innovative projects aimed at business digitization, focused on improving the level of external customer satisfaction (CIO, 2017). The company AGCO uses as a test Glass, augmented reality glasses, connected by tablets to access the platforms, which was created by Google. The objective is to use the technology in the monobloc assembly line, a kind of tractor chassis, with the spectacles reading the specification code and identifying the product. It was initially adopted in the United States, and in Brazil it is still in the test of expansion by the firm itself, since 2015 (REVISTA SMALL ENTERPRISES, GRANDES NEGÓCIOS, 2017). In relation to STHIL, a new R & D center was launched in 2017, following the standard matrix model in Germany, through individual test rooms, engine room and administrative areas. The adopted technologies are based on the digitization, optimization and automation of the manufacturing processes, as mentioned in the research source. The completion of the R & D center is expected at the end of 2018 (BRASILALEMANHANEWS, 2017).

The company AEGRO was founded in 2015, and is present in nine rural properties, rice producers, located in the western border of RS. The future idea is to expand to other grain crops, with the intention of improving the productive, financial and commercial processes. This application can be used on mobile phones, tablets, where it provides timely and accurate information. Thus, improving soil preparation, process management and use of pesticides. This scenario is appropriate to the Big Data, technology belonging to industry 4.0 (CORREIO DO POVO, 2015). The ARPAC is startup incubated by Unitec of the Tecnosinos of São Leopoldo, develops remotely piloted aircraft or large drones destined to the agricultural spraying, as much of defensive as for seeding. As advantages, it indicates the economy of treating diseases and pests of the crop, being necessary the aid of the pilot in dangerous areas and agility in the application (JORNAL OF THE COMMERCE RS, 2017). Agrosmart, the leading digital agriculture platform in Latin America, was selected among hundreds of applicants worldwide as a technological pioneer by the World Economic Forum in June 2018. The company applies data science in the agricultural chain with a proprietary and unique approach, based on genetic material, soil type and microclimate. From research to industry, it provides intelligence to different parts of the production chain, promoting more sustainable, productive and climate-resilient agriculture. Embraer, a Brazilian aircraft manufacturer, has embarked on the new wave. One of the concepts of this industrial revolution, the so-called paperless (paperless) has been implemented since 2012 in its factory. AntônioCarmesini, director of Embraer's Manufacturing Engineering, says that 80,000 to 100,000 designs were needed for the construction of a large aircraft and they were handled in production. Today everything is digitized. In addition to reducing costs, he says, there is a greater accuracy of reading, since the drawings are in 3D, and no more 2D as in paper. This enables real-time adjustments to the drawings that are in the factory. Since 2015, Embraer has installed sensors in the equipment of its lines to monitor the operation of each of them. We avoid unscheduled stops, for example, that can delay the delivery of an aircraft. If the sensor indicates a level of trepidation, or higher temperature, we already know that there is problem and what to do to heal it - says Carmesini.

Volkswagen do Brasil stands out worldwide for investing in modern vehicle manufacturing concepts using its latest generation applications, machines, tools, devices and software in its factories. Currently, Volkswagen of Brazil is investing in robots, intelligent machines, jobs that communicate interacting with the vehicle in processing, digital factory, systems of traceability, intelligent logistics, 3D prototyping, among others. At the Volks units in Brazil, all projects are already born of a digital model, integrating the concept of paper less. Products are simulated in 3D, which speeds up production. The objective is to reach a stage already lived in German production, where the consumer chooses the color of his vehicle at the dealership, and the information is passed to the production line, where machines receive the order and make the necessary customizations of each unit.

The automaker makes constant investments in technology to increase the efficiency of its processes, seeking to satisfy the expectations of its customers with high performance and quality. Bosch, one of the pioneers in the development of Industry 4.0, has a new vision of the trend adapted to the Brazilian market. The lack of maturity of the industrial parks in the country made the company develop a work of demystification of the concept and create a solution focused on what is seen as essential: the data. "We agree with the whole idea of Industry 4.0, so much so that Bosch is the first signer of the initial recommendations document on the subject, but this more holistic view, with robots and augmented reality, is not what can be done in Brazil in this moment, "says Fabio Fernandes, Bosch industry specialist 4.0. According to CNI (National Confederation of Industry), Brazil has about 700 thousand industries, which total more than 5 million pieces of equipment. The machines in use in the country have, on average, between 15 and 20 years. In addition, 95% of them are not connected to the internet. According to a survey carried out by the Industry Project 2027, an initiative of CNI and the Euvaldo Lodi Institute (IEL), Industry 4.0 is a reality for only

1.6% of Brazilian companies in the industrial sector. In 10 years, the projection is that 21.8% arrive there. According to the study, only 15.1% of those surveyed have projects in the areas of internet of things, artificial intelligence, cloud storage and big data, the combination of which generates the advanced manufacturing scenario described by the term Industry 4.0. Bosch began to deploy in-house concepts of 4.0 This started to create production bottlenecks because the company became more flexible and responded better to the market but realized that its suppliers and partners were not following because they are not connected. We noted that something seen as affordable at Bosch was not simple for most companies, the executive adds. In addition to the lack of equipment prepared to keep up with the trend, the company also found a low investment capacity in the modernization projects. With this, Bosch started to work with a different process from the one applied in Germany to serve the local industries, focusing on sensors and data analysis. We have developed a solution dedicated to the Brazilian market, which allows us to collect data and give transparency to the factory floor without necessarily investing in high technologies, with a relatively low cost, explains Fernandes. The company's idea is to work initially on projects focused on maintenance, to improve the productivity of the industry and reduce costs with inventory and personnel, as well as offering machine availability. "In the market we saw that for a small and medium-sized company, a project of R$ 500 thousand was very high, but today we can work already in a band of R$ 300 thousand", reveals the executive. The solution developed for the Brazilian market was implanted in an industry from Santa Catarina (which was not named) in a Bosch-financed project. The plan for 2018 is to do two more jobs on the same model to test the system. In 2019, the company will officially bring the solution to the Brazilian market. Then, the idea is to transform the new vision into a global product of Bosch to operate in markets with the same Brazil, like other countries in Latin America, Central America and India.

Conclusion

The deployment of the 4.0 industry will bring major transformations to the job market. According to Cezar Taurion, president of Litteris Consulting, specialized in technology, there will undoubtedly be a reduction of vacancies in factories. It will not only affect the workers, but also the administrators with the artificial intelligence.

The challenge to maintain the level of employment is to empower. The estimate is that in a factory with one thousand employees in production, there would be one hundred in processing to production 4.0. New functions tend to be created. A new trend in the choice of professions is expected in the next decade. New ones will emerge and existing ones will need specializations to accompany the transformations brought about by technology in all fields of society.

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