



Technological prospecting study focused on medical products and smart devices for safety and well-being

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Abstract

Inserted in the context of the 4th Industrial Revolution, this technological prospecting study aimed to map scientific and/or technological developments capable of significantly influencing the industry, economy or society as a whole, focusing on medical products and intelligent devices for security and well-being, seeking the identification of factors that can be determinants of success in a new global economy.

Key words:

Technological Prospecting, Medical Products, Safety and Well-being.

Introduction

The world economic growth has fallen in the last 50 years, something alarming, and that only a 4th industrial revolution, already in progress, based not only on the increase of productivity, but on this increase linked to a large scale customized production (flexible) and that meets the sustainable tripod (social, economic and environmental - facilitated by the proximity of production to the consumer market), will be able to change this scenario of stagnation. The secret is the integration of industry with major technological innovations.

Within this scope, products and devices linked to well-being and health are directly related to the quality of life of the population, demonstrating that it is necessary to innovate in the ways of offering services and products to adequately attend to numerous populations such as the Brazilian one. In addition, adapting to ongoing changes can be a determining factor for the survival of companies, as well as for the growth of current developing countries, such as Brazil.

This research aimed to make a study of technological prospecting within the context of medical products and smart devices, in order to make feasible and direct the industrial development of the sector.

Results and Discussion

Initially a bibliographic review was carried out to know the technologies of the area and the context in which they are inserted, as well as to understand the demands of the Industry 4.0. Then, a survey was carried out in a database, verifying the presence of the characteristics of this new revolution in the patents of the products and, finally, a questionnaire approved by the Research Ethics Committee of Unicamp under the number CAAE 04165718.4.0000.5404 was applied to specialists through the Delphi method to validate the deficit points pointed out by the research.

In the review phase, it was possible to verify that the Brazilian medical equipment industry is mostly made up of small and medium-sized companies, it is characterized by a complex sector due to the enormous diversity of existing products and the EMHOS industry (equipment, medical materials, hospital and dental), which demonstrates a small productive base with low technology incorporation, exporting technologically dense accessories and importing high added value equipment². Smart devices include those covered by the emerging

concept of "smart health" and the main ongoing change that tends to keep up is the patient's digital experience.

One of the main documents¹ of the review is an analysis carried out by the specialists of the triple propeller (Companies, Government, Academy) through workshops in which they sought to highlight the main challenges of advanced manufacturing in the country, as well as collect proposals for solutions to them that the results were separated into themes and sub-themes.

The analysis of patents was restricted to the base of the Brazilian National Institute of Industrial Property and to the products aimed at the disabled and the elderly, because of the significant way that this represents medical products, besides the significance of the portion of the population that the individuals of these categories represent. With a refinement of the title, of the 224 patents mapped, only 16 were linked to subtopics mentioned in the document cited above.

Seeking to confirm which of the other sub-themes represented challenges for the health sector, specialists were consulted. The results treated using the Lawshe method indicated that the main points to be worked that obtained more than 50% agreement among the experts are "Big Data Management", "Scanning/Cyberphysics", "Information Management and Technological Knowledge", "Investment in Education", "Systemic Skills", "Fomentation and Incentives" and "Access to Infrastructure".

Conclusions

The study of technological prospects developed allowed to define the points to be treated that enable the medical products and smart devices to follow the changes of the Industry 4.0.

Acknowledgement

The thanks are dedicated to the University of Campinas, School of Mechanical Engineering and SAE/UNICAMP.

¹BRASIL. Ministério da Indústria, Comércio Exterior e Serviços; Ministério da Ciência, Tecnologia, Inovações e Comunicações. **Perspectivas de Especialista Brasileiros Sobre a Manufatura Avançada no Brasil**: Um relato de 'workshops' realizados em sete capitais brasileiras em contraste com as experiências internacionais. Brasília, DF, 2016.

²BRASIL. Ministério da Saúde. **Avanços e Desafios no Complexo Industrial em Produtos para a Saúde**. Brasília, DF, 2017.