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The intellectual capital and the creation of value in research units linked to the Brazilian Ministry of Science Technology and Innovation

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Abstract

The study investigated the understanding of the directors and managers of the Research Units (Unidades de Pesquisa – UP) linked to the Brazilian Ministry of Science, Technology and Innovation (Ministério da Ciência, Tecnologia & Inovação – MCTI) on the creation of value and innovations from Knowledge and Intellectual Capital management, analyzing their understanding of the theme and the way in which the intangible assets – mainly information and knowledge – are transformed by the UP. To develop the objective and research question, it was necessary to (i) characterize the organizational context of the UP, (ii) to discuss the applicability of the relevant conceptual framework to Knowledge Management, Intellectual Capital and Intangible Assets in order to follow the value created within the UP, (iii) demonstrate the recognition of the innovations achieved by the UP and the way they are viewed by the managers, and (iv) portray the understanding of the directors and managers about the Intellectual Capital within the unit in which they are inserted. A descriptive approach was adopted, with functionalist discussion and quantitative research to measure the relationship between the data and test hypotheses about the sample – the interdependence between value creation drivers and the differentiated perception about value creation via intangible drivers. The findings allow to affirm that there are distinct clusters of UP, with greater importance, in general, attributed to Relational Capital.

Keywords: Science and technology; Intangible assets; Intellectual capital; Knowledge management; Value

Introduction

Research institutes have an unquestionable responsibility and importance in the development of science and technology in Brazil and all over the world. They have a direct commitment to the creation, retention of knowledge and new practices, with the purpose of converting them into value, thus meeting the needs and demands of society, solving problems in the cities, favoring the increase of the agroindustry production, as well as helping the organizations to maintain competitive differentials that allow to overcome the obstacles interposed and the positioning in a turbulent market, thus leveraging the economic development of the country (Cavalcanti, 2001; Tigre, 2006).

The Ministry of Science, Technology and Innovation (Ministério da Ciência, Tecnologia e Inovação – MCTI), one of the main knowledge gatekeepers in Brazil, congregates federal Research Units (Unidades de Pesquisa – UP) in several States of the Federation, which evolved according based on the development needs imposed by the socioeconomic advance and, consequently, storing knowledge throughout its existence (Brazil, 2015).

It is important to emphasize that, currently, the real wealth of a country derives from the creation of knowledge (Cavalcanti, 2001). This, in turn, transforms and returns in the form of brands, patents, products, scientific research, publications, certifications and tools that guarantee a greater competitive advantage, becoming a benchmark in a globalized market (Barney & Hesterly, 2006). It guarantees economic, intellectual and social growth,

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thus achieving a competitive differential for society, organizations and the country.

In this context, knowledge becomes a differential factor for many organizations, whether public or private. Organizations in the knowledge age are in constant process of change, and the valuation of Intellectual Capital and Intangible Assets is an imperative issue in this new scenario (Cavalcanti, 2001; Rezende, 2014).

According to Sveiby (1998), the management, evaluation and creation of these intangible stock and flows are of vital importance to organizations. Wealth and well-being previously assessed, quantified, and measured by physical capital assets are measured based on intangibles, knowledge created, managed, shared, transferred, and retained within organizations (Barney & Hesterly, 2006). In addition, it is important to note that the use of resources – including, but not limited to, intangible assets – can generate extraordinary profits, which are ultimately responsible for the creation of company value.

With the popularization of information and communication technologies, new markets, professions and products have emerged. As a result, these drivers force a change of focus and management models adopted by the organizations, leading to new strategies to be able to understand the existing disruptive technologies and to guarantee new commercial relations without losing the already acquired market reputation. According to Davis and Meyer (1999) we are in the era of the Blur economy where there are no longer stable solutions, where successful ventures, whether public or private, are not "resting" at any time.

The Blur era consists of speed, connectivity and intangibility. From this perspective, phenomena such as globalization, the opening up of new markets, resulting from increased connectivity of markets and the flows of products, capital and technology between the countries corroborate with this idea and impose on companies reformation in their form of organization and the adequacy of its functional areas, through constant innovation in all its processes, in order to meet the requirements of global competitiveness. This implies new standards of competitiveness (Davis & Meyer, 1999).

In the global context, research institutes in industrialized countries undergo a process of intense and rapid transformation, due to the increasing complexities in organizational processes and research and development activities, in order to find solutions to the problems of society and industry, such as Also bring increases in scientific and academic production.

This study presents, as main objective, the intention to demonstrate how the typical resources of Knowledge Management and Intellectual Capital, in the mainstream sense (Edvinsson & Malone, 1997; Stewart, 1998; Sveiby, 1998) and Brazilian researchers (Cavalcanti, 2001; Rezende, 2014; Tigre, 2006), interact directly in the creation of value. As a plan, the study is an analysis that focus approaches and means with which the UP interact with knowledge management and intellectual capital. To reach this objective, a survey was applied to the directors and managers of the UP.

The academic interest directed to the study of intangible assets and intellectual capital in UP was the engine for understanding how the interactions between them can contribute to the creation of value.

It is important to have as background the institutional missions of the UP, as exemplified below, aligned through a regulated management agreement and signed each year between the management of the MCTI and those of the UP – with an undeniable responsibility for the transformation of knowledge into value, through its scientific production, in patent creations, scientific works, certifications and products.

- INT National Institute of Technology: "Participate in the sustainable development of Brazil, through technological research, transfer of knowledge and promotion of innovation" (National Institute of Technology, 2016).
- LNCC National Laboratory for Scientific Computation: "Research, development and training of human resources in scientific computing, especially in the construction and application of mathematical and computational models and methods in solving scientific and technological problems, as well as providing computational environment for processing of high performance, aiming at advancing knowledge and meeting the demands of society and the Brazilian State" (National Laboratory of Computer Science, 2016).

The Ministry of Science Technology and Innovation has a fundamental role in the socioeconomic development of the State. To ensure its consolidation, MCTI uses as a tool the production and popularization of Science, Technology and Innovation, emphasizing those applicable to populations in conditions of social vulnerability (Brazil, 2016).

The Department for Science, Technology and Innovation for Social Inclusion (SECIS), created in 2003, formulates, implements and monitors policies, programs, projects and actions to disseminate scientific, technological and innovative knowledge. To do this, integrates and applies various social institutions and media education institutions rural and urban, through the process of educational training and professional training, considering the socioeconomic conditions and the regional peculiarities of the communities. Thus, it contributes directly to reduce inequalities of opportunities, to stimulate the generation of employment and income, to improve the quality of life and to lead the country to a sustainable development. It is up to the UP to develop structuring projects that meet these types of demand (Brazil, 2016).

In Brazil, validated studies point to a small number of researches on knowledge management (KM) and intellectual capital (IC) applied in institutions related to UP (Appendix 1).

It is, therefore, an open field for exploration and description of the mechanisms capable of characterizing the creation of value in science, technology and innovation.

In this sense, the purpose of investigating the UP managers' understanding of the conversion of Intellectual Capital into innovation and value – characterizing their sense of the role of intangible management and the way in which transformation is seen of knowledge by the UP – and as a driving force the research question "Which components of intellectual capital are present and how do they interact in the creation of value in the context of MCTI's Research Units?"

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