# Intellectual Capital and the Value Creation: We Achieved One of the Main Goal or Not?

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***Abstract*—** The goal of this research, translated into paper, is to research whether there are relationships between intellectual capital, on the one hand, and value creation, on the other. The first should be a cause of the second. From research selected between the 2 topics, together, it appears that these relationships were little or nothing evidenced in the literature review carried out. These are mere exercises that are based on a stamp that has a high statistical, econometric content (especially in the domain of Partial Least Squares – PLS), which prove to be unsuitable for practical application. It would be expected that, given that the intellectual capital is the main basis for creating value, more practical examples would be obtained. All the more so as this relationship is often referred to. In addition to the scarcity of relevant literature that is confined to these 2 topics only, it appears that the work capable of explaining value creation appears to be very limited, and even unintelligible, whether for academic scholars, researchers specializing in the area, or above all, lay people (for whom supposedly it should be of maximum use, from the point of view of application). The literature review in these 2 areas needs much further development focused on its real usefulness, to apply in practice. In any case, in this domain, we can see a source for future developments, guided by more consistent and useful criteria in the practice of real business life.

***Keywords*—** Intellectual Capital, Value Creation, Business Performance, Competitive Advantages.

## INTRODUCTION

In the domain of intangible assets, we have that the intellectual capital is a topic that, very rarely, appears in isolation. Indeed, in the relevant literature such as [13] and [14], it refers to relationships with other topics such as innovation, performance, competitive advantages, among others.

More specifically with regard to knowing what it consists of, that is, its definition, [11], [12] and [19], consequently, ways of measuring [15] and [16] and of knowing its value [16] and [17], it should be noted that they are still to be clarified and accepted by the scientific community, in a consensual way, what the intellectual capital consists of, how to measure it and know its value. Here in this aspect, it is necessary to know what the sources of variation are, in order to increase or decrease or maintain it, seen in a dynamic perspective in time and not static [20], [21], [22], among others authors.

In fact, while this triangle, interconnected, is not based on consensual bases, everything that appears in its sequence is, at the very least, limited, with regard to the expansion of scientific knowledge.

The interconnection between the intellectual capital and value creation is a dual theme, very relevant insofar as the first allows the creation of the second. And, the first makes sense if, among other aspects, you create the second. Thus, from the outset, there is an identified problem (gap): how to carry out subsequent research, without its definition-measurement-value not being consensually defined and accepted by researchers and the scientific community?

There is no accepted answer. However, there is a plethora of research that combines several topics. One is the relationship between the intellectual capital and value creation.

Our research question is as follows: what does (any) relevant literature refer to the relationship between the intellectual capital and value creation? Has one of the most important goals associated with the intellectual capital been achieved?

One of the contributions of this research is to know, despite the existing base limitations mentioned, which substance is obtained?

Thus, our research is divided into 3 sections: Introduction, which briefly alludes to the topic, synthetically; Literature Review, which refers to the most important aspects of the consulted papers on the 2 joint topics; Conclusions, where the main conclusions drawn and most notable are presented; it ends with the References both used and consulted.

## LITERATURE REVIEW

[1], are authors who carried out research on the possible relationships between the intellectual capital and value creation, in the context of the banking sector in Portugal, according to the empirical evidence obtained. The

authors emphasize that the intellectual capital is an intangible asset and can be used as a source of sustainable competitive advantages. They further affirm that the components of definition of intellectual capital (human capital, structural capital and relational capital) did not reveal to have any interaction with each other in order to create value.

It is worth mentioning that the wealth and growth of contemporary economies are especially driven by intangible assets, in such a way that the value created depends less on physical assets than on intangible assets. These have been identified as a set of intangibles (such as resources, capabilities and competences) that drive the performance of organizations and the value created by them according to [4], [5] and [6].

The methodology used by the authors was a questionnaire survey containing 71 items in a sample of 53 Portuguese banks, all members of the Associação Portuguesa de Bancos. It should be noted that the concept of intellectual capital was erected as a construct that required knowledge of strategic awareness on the part of researchers in relation to those interviewed in the questionnaires. To avoid multicollinearity, the authors resorted to the data processing method Partial Least Squares (PLS) to estimate the parameters of the regression equations. With regard to the sample period, there is an omission regarding the same period in which the research took place.

With regard to the outcomes obtained, the authors concluded that the business value created resulted from the interaction of the 3 components of intellectual capital mentioned. As implications of the study, it is highlighted that in order to extend the research findings to other activity sectors and other countries, this is possible as long as culture and historical diversity are important for the construction of intellectual capital to be unique.

On the other hand, for studies on the intellectual capital to be relevant, it is necessary that the estimates of the constructs used are valid and that relationships between them are obtained. An alternative approach needs to be applied to find out if it would lead to different results, as for example, in the sample, the method based on VAIC (Value Added Intellectual Capital), to know how this and the capital component employed, create value. Finally, the results show that the researchers' models demonstrate that the intellectual capital is, empirically, a phenomenon of interactions. Thus, value is created when the components of intellectual capital interact and the more (less) they interact, the more (less) value they create.

[2], is an author whose research is based on studying the relationship between the intellectual capital and value creation in the context of 250 manufacturing companies in Tunisia, with at least 100 employees.

From the point of view of the sample and the methodology used, the observations were based on a survey (questionnaire), obtained in person, face to face, using a Likert scale (with 5 points where 1 means "very much in disagreement" and 5 “very much in agreement”), and which took place in 2013. Ten interviews were carried out with the managers of 5 companies. The questions were based on ideas generated by the relevant literature. The manufacturing sector was selected because, since the year 1970, it has assumed a relevant role in the Tunisian economy, in terms of value creation, and, on the other hand, companies reveal that they invest more in intangible assets. Of the 104 questionnaires created, only 41 were completed by the respective respondents and received, and in the end, only 41.6% were used.

In the methodology, the authors used the confirmatory factorial analysis. As independent variables, the authors used human capital, organizational capital and relational capital. As a dependent variable, 6 items were defined, centered around the ideas of, the company creates value when it satisfies its stakeholders, it must have a network of relational relationships with all direct and indirect partners, it is aware of its role social and community service, adopts measures to protect the environment and maintain it, develops its own values and its own identity. As additional factors, the authors also refer to the importance they attributed to the existence of a Balance Scorecard and the creation of an ABC method to promote value creation.

As main results, the authors show 2 explanations for the observation of conflicting relationships between the intellectual capital and value creation. The impact of intellectual capital on value creation is independent of the economic situation of the country and the sector.

Rather, it is more dependent on the level and nature of the investment made by intangible companies. On the other hand, when the authors tried to see whether there would be a linear relationship between the 2, they obtained as a result that they did not introduce elements that affect the 2 variables, which in a way constitutes a way of consolidating the first conclusion. The results obtained improved the knowledge of intellectual capital, namely that there are important factors to obtain implications regarding the value created, without which the intellectual capital has a negative role that affects the company's value creation. Limitations include the fact

that the sample consisted of only 104 companies, which, compared with another study of 50 companies, belonging to the same sector, led to the same result, namely a positive relationship between the intellectual capital and value creation. The authors suggest building another sample, one in which the intellectual capital is absent and another one that is highly developed. On the other hand, the creation of value was considered in a static aspect (variable space and fixed time) and a longitudinal study (both variables) seemed very useful. Future studies should pay more attention to the conditions in which the intellectual capital has a positive impact on value creation, namely, via other variables, such as innovation in its various dimensions.

[3], are many other authors who relate the business model with the intellectual capital and value creation in companies, within a literature review. The focus is on elements that are common. They are resource-based view, knowledge-based view, intellectual capital-based view, dynamic capabilities and configurational approach. They are, so to speak, with which areas where the intellectual capital and value creation can benefit from each other, among which the classification of components, their configuration and the dynamic approach stand out. In this way, research examines 2 questions that translate into knowing what are the common concepts for the business model and for the intellectual capital? What are the common concepts? What does the dynamic approach to intellectual capital and business model mean? To answer these questions, the authors decided to find out what exists in the academic literature regarding theory and empirical evidence and to identify research questions that would allow them to answer them. The Web Of Science Core Collection Database was the main consulted.

In terms of the main conclusions obtained by the authors, the fact that these 2 concepts were based on the basis of strategic management is highlighted, which makes it possible to design a more cohesive model. In particular, it is worth highlighting the point of view of the relationship between the intellectual capital and its components and the creation of value (in the form of income), which represents a set of market opportunities for partner companies, which allows them to benefit from them established relationships. Access to better information with any entity, allows better benefits than its main competitors. Via the use of synergies derived from limited transaction costs and access limits to its main competitors. In particular, they observed a link between the business model and the intellectual capital in particular with the components of relational capital which may not be total but, in any case, is partial, corresponding to the structural and relational components. The value creation dynamic between the business model and the intellectual capital occurs due to the existence of a single combination of its components. If you include the time factor and variations between the business model and the intellectual capital, this causes an open question (or several) to persist, particularly when the problem of the business model and the components of the intellectual capital is considered in what is refers to its operationalization. This, as well as ways of measuring the business model, remains an open question.

Thus, a separate issue is the fact that the methods of measuring and operationalizing the intellectual capital are mainly direct in capturing the company's status quo, that is to say, intangible assets. Similarly, in the case of the business model, only its components are present without providing any discussion that allows for deep interpretations, either of the dynamics of the changes suffered or the ties of the relationships established with them. A final idea: it remains a challenge to measure and manage dynamics of intangible assets in order to examine how they relate to each other, and how a change in one resource causes changes in others, leading to changes in the entire business model of a company.

[7] these two authors, in turn, carry out research that is more of a theoretical (than empirical) nature, as they relate value creation to business models within the scope of refocusing the debate on the capital intellectual. Generally speaking, the authors' research can be summarized as an examination of the reporting business and the concept of the business model from the perspective of intellectual capital, seen as a key value factor in the knowledge economy and, therefore, as the central element of the reporting business model.

The paper is structured as follows: a section that addresses the relevant literature on accounting from the relevant literature on management, in particular strategic management, another section that reviews the reporting of intellectual capital in business reporting in general, from the accounting point of view, another section in which the discussion is discussed based on the evidence that illustrates the interviews and that, in this way, highlights the distinction between these different literatures, making the synthesis of the key elements, the relevance of what constitutes the center of research – the future of business reporting and the implications for the intellectual capital research, to end with a final section extracting the main conclusions.

Thus, from the point of view of the conclusions drawn, it should be noted that, while the debate on the

accounting model business reporting has its first main element in the economic theory of the company, the literature on the intellectual capital accounting has gathered its basis in theories about the management of the company. The paper argues that the relevant literature on the intellectual capital has its intersections with the more generic debate on business reporting in relation to reporting of business models. On the other hand, if the literature demonstrates that the business model is a high-level concept, then it should be the driver of intellectual capital and its dissemination and not any other way. The focus of the intellectual capital reporting framework is on the intellectual capital resources and not on managing the business as a whole. Which explains why this reporting framework has not yet been widely adopted in practice. The fundamental elements of the reporting model are: an explanation of the static pattern that distinguishes it from other features and capabilities that create value for the customer; the company's dynamic capabilities include the detection and surveillance of elements from the context of the business environment and management's transformational abilities. Thus, the business model concept is holistic and systemic. And they conclude that: whoever saw economics and accounting as if they were incompatible twins, now [sees them as] (not) compatible triplets (p. 24).

[8] are authors who have focused on their research on the intellectual capital and value creation in Spanish companies. The main goal is to explore and explain the influence of representative variables such as human capital and structural capital on the aforementioned creation of value.

The research is structured along two main axes: the first is through exploratory research that begins with a sample of Spanish companies located in this geographic area: the autonomous regions of Castilla and León. The choice is based on an attempt to find out whether, by improving the response rate, according to the representativeness of these regions, with regard to both the activity sectors and the size of the companies, conclusions can be drawn for the national whole (Spain). According to the authors, this is a region that occupies 18.7% of the total area, and generates 5.4% of GDP. On the other hand, the choice also seeks to know whether exploratory research allows testing the possible relationship between the components, called indicators, between human and structural capital and the economic results shown in the Financial Statements; the second is to know whether explanatory research, relating to the intellectual capital in general, and to the human capital and structural capital components, is due to the ability to stimulate the creation of value. Empirical research to date provides contradictory results not allowing any conclusions to be drawn from the Financial Statements, moreover.

As the main conclusions of the research, the authors emphasize that the theoretical literature consulted confirms the usefulness of human capital and structural capital, as components of intellectual capital, as indicators, of companies that decide to adopt them. Even for those in which it is difficult to evaluate its implementation in monetary terms, the obtained elements allow to control and visualize that these components are key to the generalization of the new knowledge that constitutes the main source of value creation. This research also examines whether the theoretical proposal supports the empirical evidence. Through the exploratory analysis, the implementation of the 2 components allowed us to conclude that it is in the human capital component (staff training and occupational accident) that it is of special relevance (more than in the other). However, they concluded that there are relevant differences in the activity sectors, in the automotive sector, software and development. In the area related to structural capital, what was most notorious was the quality of the functioning process. Through the explanatory analysis, this allowed us to fulfill the goal of the study via new independent variables that influence the creation of value and to conclude that companies included in the sample that use the 2 components exhibit a positive relationship with sales growth. However, the study found no evidence of relevant relationships between the use of human capital and structural capital or other variables in sales growth, Return On Assets (ROA) or productivity. A larger sample would be more promising in the results even to find new, more relevant relationships. Thus, future research proves to be necessary, with the particularity of varying time and space, via panel data analysis.

[9] in this case, we have a research that investigates whether the relationship between the intellectual capital and value creation has in its midst the lack of a component related to innovation capital. Basically, it is knowing the role of innovation in creating value in companies. To research the differences, the VAIC (Value Added Intellectual Coefficient) indicator was considered.

With regard to the methodology adopted, in the sample, the authors resorted to listed companies belonging to the semiconductor activity sector on the Taiwan Stock Exchange. In all, 519 companies were considered, in the period from 2000 to 2008, based on the Financial Statements, made publicly available by them. They

resorted to econometric regressions. In the dependent variables, they considered 4: GPM (Gross Profit Margin), ROA (Return On Assets), ROE (Return On Equity) and EPS (Earnings Per Share), as a proxy for measures of operating finance and stock market performance. As independent variables, we considered 4: HCE (Human Capital Efficiency), VA (Value Added), Human Capital (HC) and Human Capital Efficiency (HCE), Structural Capital (SC), Structural Capital Efficiency (SCE), Capital Employed (CE), Capital Employed Efficiency (CEE), Research and Development Efficiency (RDE). Dummy variables such as Intellectual Property Rights (IPR), Corporate Social Responsibility (CSR) and Board Composition (BC) were also used.

As main conclusions, it is worth mentioning the fact that the results showed a significant positive association between CEE and the financial operating of the companies, while the HCE and the SCE did not prove to be significant. This indicates that traditional measures have not proved to play an important role in reducing companies' production costs. Additionally, the results indicated that the traditional components of intellectual capital revealed to have a negative association with financial operating and stock market performance. The results also subverted the understanding of the prevailing understanding that human capital, structural capital and social capital play relevant roles in creating value for stakeholders. However, the association between R&D expenditure efficiency (RDE) and operational, financial and stock market performance is positively significant with regard to the semiconductor activity sector in Taiwan. This indicates that, the perceived R&D is a source of value creation when outsourced most of the manufactures outside the companies. Finally, the results also showed that IPR's have a significant positive association with operating performance and in the stock market, which means that IPR's maintain an importance for the competitive advantages of companies, accompanied by a relevant role in value creation. However, the results seem to indicate a positive association between Board Composition and company performance.

The main implications highlighted are that the VAIC allows managers to measure their intellectual capital and compare it as a reference against other competitors in the same activity sector. However, in the highly technology-intensive sector, the VAIC measure may not be sufficient to assess the value of companies with regard to their performance, with regard to the added value of their intangible assets. Thus, the research adds that R&D expenditure in the VAIC method demonstrates a better explanation in knowledge-based management of the economy. Additionally, the results are consistent with Taiwan's semiconductor sector companies in their actual situation regarding the role of intellectual capital in value creation.

[10] are many other authors who carried out research on the relationship between performance and the intellectual capital and how facilitators lead the creation of value in organizations (companies). According to the words of the authors, this research intends to explore the existing relationships, perhaps, between resource-based view, the intellectual capital and knowledge creation.

From the outset, it should be noted that the research focused on the biotechnology sector of Spanish companies. It is a sector with a high level of innovation and is a key factor for companies to gain competitive advantages and create learning processes. There is, on the other hand, the use of highly qualified labor, as well as a high level of intellectual capital and constant learning processes. These companies are knowledge-based, which requires that key resources make it possible to increase levels of knowledge and improve innovations and maintain competitive advantages.

From the point of view of the methodology used, the authors used a 7-point Likert scale (where 1 means “extreme disagreement” and 7 “extreme agreement”), which consisted of 52 items addressed to the respondents. These 52 covered 8 constructs: for intellectual capital (21 for human capital (7) another 7 for structural capital and 7 for employed capital), for knowledge creation facilitators (6 constructs, 4 items for each facilitator). The sample consisted of 236 Spanish companies in the biotechnology sector and the method used was the Partial Least Squares (PLS), to analyze the sample observations, covering the period ending at the end of 2011.

In relation to the main conclusions drawn by the authors, some more notable ones should be highlighted. The model used allowed us to identify the role that facilitators play in the creation of knowledge in the relationship between the intellectual capital and performance. These facilitators are closely linked to the strategy, and clearly identify products and services, playing the role of catalysts in improving the performance of companies and leading them to maintain competitive advantages. Quantitative or qualitative studies are scarce in this domain and, consequently, the construction of scales and their validation to measure concepts suffers from the same scarcity. The answers obtained on the Likert scale allowed us to indicate the existence of evidence of channels through which the

efforts proved useful to improve business performance. The intellectual capital positively influences the studied facilitators; in intention, autonomy, fluctuation, creative chaos, variety, redundancy, and truth and commitment. Thus, the results provide empirical evidence of the existence of a positive relationship between the intellectual capital and knowledge creation facilitators, which until now have always appeared isolated and unrelated (in the literature that the authors consulted). In short, the results reiterated the companies' need to achieve their goals and targets. The knowledge and skills of the members of the companies are irrelevant if they fail to channel these resources, clearly defining the goals of the companies. The main limitation of the study, the authors refer, is the size (of the companies): small for data collection (end of 2011) and in the following years the Spanish economy continued to experience a deep crisis that affected the targets of the companies. As future research avenues are the application of the same to other activity sector that are intensive in technology.

## CONCLUSIONS

In this paper, it was our goal to make a brief incursion into what the relevant literature says about the intellectual capital and value creation. This is one of the topics with high potential, as value creation is essentially based on intellectual capital, especially, although other intangible assets may also have relevance and relationship in the same context, such as the property rights, patents, in particular.

In general terms, it can be said that, as with other conjugated topics, this one, in particular, based on the selected literature, although it is scarce, relevant research is not visible in such a way that one can say what to say. , in this way, the scientific knowledge in the field has been expanded.

What can be seen, from the outset, is that, namely, also with the limitations of the sources (primary and/or secondary) of basic information, and the techniques used to analyze them, it appears that what is obtained is an amalgamation of research, which, underlyingly, is based on more intentions to publish scientific work (more or less scientific) serving more to present and have published allegedly carried out research.

One of the greatest uses of intellectual capital is knowing its value. In a dynamic perspective as if it were any other product. Even, due to its intangible nature, it will end up in it: it has a value and a price. Assuming that it creates value and knowing this, one might expect to know the value of intellectual capital, although not per se but in terms of what it was able to create. This created value appears, in an unequivocal way, as what gives rise to it. Therefore, the hopes of getting knowledge and its contributions, with validity and application in practical reality, are frustrated.

For this reason, it cannot be used in any activity sector and, therefore, it does not make a contribution that bridges theory and practice. What would be the most relevant?

It can be said, without a shadow of a doubt, that it is not possible to apply and obtain results on the value of intellectual capital, much less on the value created by them.

It can be assumed that the authors will not be unaware that the practical utility was very meager. The link between the academic world, which produces knowledge, instead of having built one or more bridges, has yet to build one, hence no potential in the development of research, in terms of practical use, can be seen. Can we apply in practice something that used Partial Least Squares? If so, first we have to know what it is, how and when to apply it, among other facets. Therefore, science has not known advances, because there were no contributions with this motivation. These will have been others but, in the practical reality, the utility is zero or equivalent.

One of the contributions to the scientific knowledge of this research is that its substance has a source (small or large) so that it can be considered relevant and constitute a basis for works with scientific value and practical application. They haven't emerged yet. One of the limitations of this research is, as can be seen from the scarcity of literature on the 2 topics. But, perhaps, if more existed … it would be more of the same. Applied to the Portuguese reality, the omission of the time when the study was carried out is extremely important. All scientific work has to be situated in time. Furthermore, it is scarce. In other countries, the same is true. Broad activity sectors are absent or to be done.

In its implications, we can mention that this paper is more research, without a defined focus, which contributes to making its understanding more difficult instead of facilitating it. Sometimes it refers to innovation and it is not clear how it comes about. It is only built and, if it is deconstructed and reconstructed, it also translates into created value (which?). We have associated imagination and creativity with innovation, and nothing is known about these 2 foundations intimately interconnected with innovation. What is innovation embodied in? Is it constant in time? It makes more sense that it is variable and changeable, but there are no answers for it because even questions are not

asked. It is a given (?). The substance obtained is (very) meager.

Answering the research question, the answer is that there is no clarification (where it would be of all usefulness) in the relationship between intellectual capital and value creation. The most important objective has not been achieved and, to be able to be so, it has to be practically applicable, stripped of useless technicalities, scientifically and in real life.

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