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Intellectual Capital and Information: Examples About Some Relationships

Óscar Teixeira Ramada[1]
Atlântico Business School, Porto, Portugal

Abstract. This research aims to know some examples of papers that relate the intellectual capital and information (the theory of) and the relationships established between both. Previous research, up to this date of 2022, has been insufficient and disjointed in a single direction. There is a lack of objective approaches (instead of subjective), and there is a lack of approaches that allow replications to reality and, above all, that make it possible to know the intellectual capital and information (the theory of) to make known an objective value, expressed in euros, as if it were other products. At the same time, there must be dynamics that make it vary over time, know its sources of change and know what makes it remain the same, raise or lower its value. Once this desideratum is reached, the real objective that materializes the intellectual capital and the information (the theory of) that underlies it is reached.

Keywords. Intellectual capital, definition, measurement methods, information (the theory of)

1. Introduction

With regard to the intellectual capital, relationships have often emerged that make it associate information (the theory of) and knowledge [1], [2], [3], [4] and [5]. Although, on the one hand, this makes sense, on the other, it is necessary to know what information (the theory of)/knowledge is involved in the business world: tangible or intangible assets? And in which activity sectors? Is this knowledge protected or is it freely available? These are some questions that are most immediately raised.

There are authors such as [6], [7], [8] and [9], who focus their research more on the foundations of the intellectual capital that are their own definition, the ways to measure and, finally, the value possessed by it.

Thus, although it is not an erroneous association, it does not clarify these basic foundations, which makes it difficult to make the association between the *intellectual capital* and *information (the theory of)/knowledge*.

This comes from not precisely defining the concept(s) of the intellectual capital and, therefore, the information (the theory of)/knowledge associated with it(s). However, [6] and [7], make a contribution towards distinguishing properly and in a way acceptable to the scientific community, a definition regarding its definition in the number of

[1] Corresponding Author, Óscar Teixeira Ramada, Atlântico Business School, Porto, Portugal;
Email: oscarramada@gmail.com

components and in their content. In the first author, the components are 3: human capital, structural capital and capital employed. In the second author, the first 2 components are the same, but the third one is different: customer's capital.

Following the title above, the following research question can be raised: *what do some examples of research that relate the intellectual capital to information (the theory of) say?*

In a way, these are not concepts with very marked differences. However, this idea lacks scientific proof and hence this research.

We can then say that there is a *Knowledge Gap* (*Knowledge void Gap*), which this research intends to provide some findings.

The main contribution of this research is that, as information is often a particular case of intellectual capital and this materialized in that, it is also intangible assets such as property rights, copyright and knowledge, specific and general, in particular. Therefore, there is some convergence and/or divergence of content that needs to be researched. Through some papers that relate the 2 topics, we seek to know something about this purpose and hence the aforementioned contribution.

It should be noted that the 5 papers selected for studying were obtained from an appropriate database and that resulted from the combination of the term the *intellectual capital* and *information (the theory of)/knowledge*, having obtained those referred to.

The criterion for its presentation is merely chronological, that is, from the most recent date to the least. In this way, it is possible to provide an idea of the contents covered, involving the 2 terms and their possible relationships each other.

This research is divided into 4 Sections: *1. Introduction* (where a brief introduction to the relationship, which may exist, between the intellectual capital and information (theory of) is made), *2. Literature Review* (where 5 research papers subordinated to this pair of topics), *3. Results and Discussion* (where are presented, the main issues or ideas raised by the Literature Review, and their most important discussion) and, finally, *4. Conclusions* (where the main conclusions that can be drawn from the research are shown). *References*, are the sources to do the paper.

2. Literature Review

[10], are authors who seek to explain, through the research carried out, the role of mediation of capabilities dynamics in the relations established between the intellectual capital, innovation performance and companies' communication technologies.

In the sample used by the authors, the authors selected 4483 communication technology companies located in 64 provinces of Vietnam, in a first phase to, in a second phase, limited to only 350, in all provinces in proportion to the size of the population. The method used was a survey in the context of a Likert scale, with 7 points, whose items vary between 1 = strong disagreement and 7 = strong agreement.

In the methodologies used by the authors, with regard to the measurement of the intellectual capital, 3 dimensions were considered: human capital, organizational capital and social capital. As measures of dynamic capabilities, 3 dimensions were also considered: learning, integration and reconfiguration. As measures of company performance, subjective measures were used because respondents exhibited reluctance to provide objective measures. Regarding the description of data, 448 surveys were distributed to CEOs, project managers and other executives of information technology companies in Vietnam, and 350 responses were received. Note that all participants were

male. In terms of educational qualifications, respondents with only a vocational school were 13, a Bachelor's degree were 267 and a Master's degree, 71. In terms of age at 20 years old, respondents were 10, with 30, there were 255, with 40, there were 81 and with more than 50, there were 5. In the professional category, 200 respondents were active in software services, 31 in hardware, 10 in hardware manufacturing, 80 in digital media and 30 in telecommunication.

In the main conclusions reached by the authors, it is immediately underlined that research reduces the ambiguity regarding the mediation of the dynamic capabilities mechanism through the intellectual capital that improves business performance. There is evidence that learning and integration capability works as a mediation mechanism between the intellectual capital and its dimensions and the performance of companies. The accumulation of human, social, and organizational capital helps companies improve their competitive advantages and performance. It is essential to develop the learning capabilities to absorb information and knowledge through the practices of business iterations.

With regard to theoretical and management contributions, those referring to the understanding of the indirect effects of the dimensions of the intellectual capital on performance are noteworthy. On the other hand, the study deconstructs the dynamic capabilities in 3 dimensions and, separately, examines the effects of each one of them.

In terms of management contributions, the results show that among the dimensions of the intellectual capital, the human capital component has the greatest direct and indirect effect on business performance. Learning capabilities involves combining problem solving and coordinating strategies and may require skills and knowledge from individuals.

In the limitations and future research, the limitation of the use of data and perception is mentioned. Thus, managers may not be able to identify many examples of practical management actions based on these results. The study also does not consider dynamic environments to be a variable in which the intellectual capital and dynamic capabilities are relevant to improve performance.

[11], deal with the information management model for the intellectual capital in higher education institutions (HEI´s) in the Sultanate of Oman (capital Muscat), in the context of a theoretical quantitative approach and practical results. This research arises in the context of the urgent need, conveyed by the authors, to know what the intellectual capital is, how to develop it and, therefore, the organizations that create knowledge. They recognize that not only is this recognition important, but that it is also important to analyze its components (human capital, structural capital a customer or relational capital). It is through these 3 factors that institutions produce knowledge and disseminate it and that serve as a means through which the amount of knowledge produced in a country can be added to that already possessed.

The authors carried out an in-depth review of national and international practices related to the intellectual capital, especially in the context of HEI´s. The description in terms of methodological development involves multifaceted objectives and indicators for each of the components defined for the intellectual capital: human capital (18), structural capital (31) and relational capital (21). On the other hand, the authors resorted to techniques called point estimate of overall performance and overall performance index, to implement and differentiate the HEI´s and its performance from each other.

They concluded, in a synthetic way, that, in the long term, the HEI´s can improve their the intellectual capital by studying the obstacles that hide the achievement of good performance. In terms of results, the authors obtained good performance in some

indicators, while in others it was below average. In any case, the proposed model proved to be adequate to implement it in HEI´s to achieve the goals and, moreover, it provided some insights for them to take appropriate initiatives to apply, and enjoy, in practice, of the proposed research.

As limitations of research, there are the lack of databases of the intellectual capital indicators, the alignment between its activities and the institutional system. On the other hand, some information was only possible through the use of verbal responses, but it was not possible to use another, more reliable procedure. Finally, other indicators could have been chosen, replacing some used and used again, which is also another limitation that other future avenues of research can (and should) address.

[12] carried out research related to the extent to which women in the management of companies correspond to an increase in the disclosure of information related to the intellectual capital in Spanish companies.

The sample includes reports from all companies listed on the IBEX 35, from the years 2007 to 2011. If the reports are sustainable, then they are the greatest means of communicating business to stakeholders, increasing transparency, achieving greater social legitimacy and increasing the reputation. During the period, companies published both annual and sustainable reports. Thus, the sample source was 25 companies, over 5 years, corresponding to 125 observations. The reports were 100 of those sustainable and 25 of those that resulted in a single combination. Panel data was the type of sample used for this purpose, in order to allow a combination of times series and cross-section data, making it possible to know the effects of specific unobservable variables. The authors also resorted to content analysis.

In terms of more evident conclusions, the authors point out that, increasing the representation of women in management, improves supervision, transparency and reduces asymmetry regarding information on the intellectual capital. The results also suggest that women also improve the monitoring of corporate bodies, which also contributes to greater transparency and increased disclosure of the intellectual capital. All these conclusions are a reason to increase the number of women in the management of companies, to bring about all these effects.

[13] investigated business disclosure and the intellectual capital, in improving the quality of relations between companies and the market. This context is included in the scope of asymmetric information. Corporate disclosure and the quality of it, which is perceived by stakeholders, is a relevant topic for analysis because it can result in misunderstandings. Businesses need to prevent this reality through proper understanding of market needs. The intellectual capital plays an important role in this area. The reduction of asymmetries in the market, with regard to information, is of utmost importance.

With regard to the adopted methodology, the authors used a cross-section framework based on the theory of signals and the theory of legitimacy. This link makes an important contribution to the understanding of relevant elements to improve the efficiency of business information dissemination and to explore the extent to which intellectual capital is a key element to understand the market.

Thus, an inductive approach is underlying the methodology, which offers the opportunity to identify instruments and models capable of providing solutions to market problems. It can be seen as a particular type of qualitative approach. In addressing this perspective, the research highlights the need to shift the focus from a company's perspective to the market with voluntary corporate disclosure strategies.

In conclusion, the authors concluded that the capability of companies to obtain and defend the built competitive advantages is very related to the information that is transferred to the market. This depends on the image of this same transferred information, which can be considered one of the most efficient instruments available to companies. The intellectual capital can be considered a good starting point as it fills the gaps between companies and acquisitions of new market meanings. Improvements in this aspect also benefit from greater appetite on the part of corporate investors.

[14], focus on the usefulness of information on the intellectual capital, from the point of view of users and preparers (companies), only from the annual reports of companies listed on the Malaysia Stock Exchange, on 5 April of 2007.

With regard to the sample, it has a size of 483, with 213 being preparers (companies) and users, 160 were analysts (brokers and institutions) and 110 banks. Those who responded from the companies were CFO and accountants because they were somehow responsible for preparing the annual reports, in addition to possessing the knowledge, competence and understanding of this elaboration. To minimize the risk of a low response rate, the authors designed 3 questionnaires: 1 for CFO´s and 2 for accountants. The questionnaires were composed of 3 Sections: A, on definitions of the intellectual capital, B, on its disclosure (having been categorized into 3 categories - NC, on innovation, XC on business partnerships and HC on the education level of workers and their Well-Being) and C, on demographic issues. In Section B, there was a combination of close-ended and open-ended questions. The first ones used a 5-point Likert scale and, the second ones, the respondents were asked to write in the spaces destined for this, on subjects about the dissemination of the intellectual capital that they understood as being useful but were not included in the questionnaire.

In the main conclusions drawn by the authors that the preparers (companies) and the external users (analysts) understood the information about the intellectual capital being useful for the decision-making process. This understanding was greater in XC, followed by NC and HC. On the other hand, the results reveal that the perceptions of usefulness of the information were statistically significant. The usefulness of information on the intellectual capital has proved to be both for preparers (companies) and for their users. However, in the perceptions for both preparers (companies) and users, no differences were observed, which means that the utility is convergent both for one group and for the other.

As limitations faced by researchers, there are only 2 groups who were asked about the usefulness of information on the intellectual capital, in addition to using only one method: the questionnaire survey.

3. Results and Discussion

Some more notable results can be underlined from the literature review. Regarding innovation and business performance, it is concluded that learning and the integration of capabilities, works as a mediation mechanism between the intellectual capital and business performance and competitive advantages, and therefore, the development of learning capabilities, is essential, to capture information and knowledge, as well as problem solving and skills, from workers. The component of intellectual capital, human capital, proves to be the most important in the context of business performance.

In relation to information management, via an appropriate model for this goal, in the context of universities, the intellectual capital can be improved as long as the obstacles placed in order to achieve good performance are known.

It can also be said that, with regard to the increase in the dissemination of information on the intellectual capital, in companies with women managing them, supervision and transparency increase and decreases the asymmetry of information regarding the intellectual capital. Consequently, the presence of the female gender in the business world, is a factor that results in these effects.

In improving the quality of the relationship between companies and the respective markets where they operate, in the context of asymmetric information, the question arises of, in this way, knowing what the markets need. To this end, asymmetries must be reduced and information must be transmitted to the markets, which allows companies to build competitive advantages. The intellectual capital plays a decisive role in this area, bridging the existing gap and increasing investors interest.

In the literature review, it can still be mentioned as an outcome that the usefulness of information related to the intellectual capital, from the point of view of those who produce it (companies) and use it (analysts), is related to the decision-making processes. However, with regard to the perceptions of both, no relevant differences were found, which means that the utility proved to be convergent for both.

From the point of view of the discussion of the results, it is important to highlight the fact that learning, learning capabilities, information and knowledge, are essential, through which the intellectual capital makes it possible to achieve (business) performance and competitive advantages. In a university context, what is most evident to improve the same intellectual capital is the removal of obstacles preventing high performances. On the other hand, regarding to the dissemination of the intellectual capital, if companies are managed by women, they will be more efficient, especially, with regard to the information asymmetry. It should be underlined that its usefulness, both for those who prepare it and for those who use it, is associated with decision-making, and the perceptions of the 2 proved, to be the same.

4. Conclusions

The topic of the intellectual capital is sometimes associated with information (the theory of). This, like that, is of the intangible type, which sometimes leads to not being distinguished, at its core, in the scientific community, even if it concerns realities with features that are not common. It can be said that all the intellectual capital has something to do with information (the theory of) but not all information (the theory of) is the intellectual capital.

As the main implications of global research, it should be noted that the intellectual capital has made contributions to the recognition of the importance of defining it and applying it in concrete reality, posing difficulties for this in terms of the appropriate indicators for this purpose, raising questions relating to knowledge and information, in general.

In terms of limitations, one of the most notable is that research to date on the intellectual capital and knowledge is historical (past) and does not allow for a prospective vision (for the future) even in the present. The value assumed by information and, above all, by the intellectual capital, remains unknown, being one of the biggest gaps in knowledge that is yet to be fully addressed.

In the future avenues of research, research is to be carried out based on current information and making it possible to calculate the value of the intellectual capital that requires information to support this purpose.

Regarding the research question, *what do some examples of research that relate the intellectual capital to information (the theory of) say?* They help with information to apply it to the concrete reality (business or institutional). But, their contents are insufficient for this purpose, currently (2021-2022).

We can say that the great conclusion is that all the intellectual capital is information, specific and diversified and, above all, knowledge, whatever the form it takes (this is what allows performance, competitive advantages, among others) but, not all information is intellectual capital (e.g. information in general, about the composition of planet Earth, about geography, about a language and its basic roots). The intellectual capital, precisely, should be something that transmits knowledge, that allows civilizational progress, the well-being of countries and citizens and, above all, in a dynamic perspective, knowing the value of intangible assets, such as tangibles. There are no reasons why it should not be so. It must be noted that the value of the intellectual capital is always dynamic (and not static over time) so, knowing the factors that make it vary (increase or decrease), it should vary over time.

Therefore, the reasons for this paper be qualified in such a way that its publication is useful, lies in underlining the differences between the intellectual capital, knowledge and information (the theory of), in addition to revealing the contents of the 5 papers referred to on this topic.

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