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INTELLECTUAL CAPITAL AND THE TRANSPORT SECTORS: IS THERE ANYTHING NEW?

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Abstract. *The main purpose of this research is to find out if, in the (scarce) relevant literature, a literature review, which relates the intellectual capital and the transport sectors, in general, there is something new in common that relates the 2 topics. The transport sectors, always but, today, more than in the past, is extremely important, both for the mobility of citizens on a daily basis and for the purpose of transporting goods. That is, directly and/or indirectly, it is pertinent. The interference of intellectual capital, on the transport sectors, potential and, in effective terms (in reality), can be important to enhance the sectors. In the selected literature, due to its scarcity and lack of substance, with a scientific contribution, what was obtained, proved to be practically null. One of the explanations that may be in the base is the lack of information that can be worked on, based on primary data. These enable, in terms of potential, public policy decision-makers, more solid and far-reaching contributions. This, today, the year 2023, is something that is still waiting and if it is not based on the public entities themselves, the waiting time will be even longer.*

Keywords: *Intellectual Capital, Transport Sectors, Skills, Performance, Technology, Innovation, Competitive Advantages*.

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Introduction

In the field of intellectual capital, from the outset, the relevant literature refers to a variety of definitions, ways to measure and calculate its value, in such a way that it makes it unclear and, above all, prevents further developments that have this basis. well defined and accepted in the context of the scientific community (Berzkalne and Zelgalve (2014), Gogan and Draghici (2013), Yildiz et al. (2014), and Sekhar et al. (2015)).

This is one of the main obstacles that affects the entire subsequent literature and its review, without forgetting the expansion of scientific knowledge in the area and related to it: performance, competitive advantages, well-being, innovation. plus the relevant literature has dealt with: (Abdullah and Sofian (2012), Bhatti and Zaheer (2014), Chu et al. (2011) and Delgado-Verde et al. (2016)).

Thus, it is immediately evident that the literature on the intellectual capital has this gap, which constitutes an obstacle that, even today, does not have a single, clarifying answer and solution, which is accepted by most researchers.

In the case of the transport sectors, it is of some interest to know if there is specific literature relating the intellectual capital with it, and if it is abundant or scarce, which it says, which it emphasizes as being more important in the field, and what insights it moves towards future developments. It should be noted that one of the main interests is to know what new contributions to the intellectual capital versus the transport sectors, are offering.

This sector, as referred Idrus and Hartati (2020), is one of those that has as an important pillar, the fact that it is decisive for transporting people and goods and, that is, for its effects in the field of mobility (by land, sea and air) and what they relate to (indirect effects but no less important). Hence, it is, scientifically, important in conjunction with the intellectual capital, because this is at the base in whatever form it is. Can it, provide contributions for the resolution or mitigation of those?

The fundamental problem is to know if there is enough literature, to know a little about the possible relationships between the 2.

In a first analysis, the answer is no: it is limited to Zemlyak et al. (2022), Idrus and Hartati (2020), Igielski (2018), Gottwald et al. (2017) and Ciziunienė et al. (2016).

However, it underlines the particularity of, at least, if it is observed that it is recent: years 2022, 2020, 2018, 2017 and 2016, respectively.

The question arises, as the most important one, is to assess, in terms of research question, what the 5 research papers on the subject say, in this case: intellectual capital and the transport sector. Do they bring something new, in the substance (content) about the form (the topic(s)) related to the mentioned pair?

The answer to this, constitutes the contribution of this research to, at least, as a suggestion, know what the relevant literature is based on a review, based on the profound scarcity of papers.

This paper is divided into 3 Sections: Introduction, in which a brief introduction to the topic in question is made; a Literature Review, which is limited to 5 papers, the little that exist on the subject; finally, the Conclusions, which consist of the main features on the subject, not forgetting some References that supported the paper (on the subject and beyond).

Literature Review

Zemlyak et al. (2022), prepared a paper whose main purpose is to research intellectual capital as a driver of technological innovation, in the context of the so-called, by the authors, industrial revolution in the transport activity sectors in the Russian Federation. It is underlined by the authors that the paper is inserted in the recent technological evolution, along with its importance for the economy and hence the need to know, both the progress achieved and the ability to absorb the effects of the intellectual capital over the technologic innovation.

The sample, consisting of 455 respondents, was based on an approach with primary data, for which a structured closed-ended questionnaire was constructed. These belonged to companies specialized in transport services in the country. The companies were different because they had also different technological levels. Specifically, with regard to respondents, in companies, they were, general managers, marketing managers, production managers and workers who worked in executive offices, R&D offices, among others who held important functions.

The questionnaire had 2 sections: a section with socio-demographic questions (age, educational qualifications, professional experience) and others related to constructed indicators (constructs) for the study. With regard to age, 122 respondents were between 21 and 30 years old, 203 were between 31 and 40 years old, 86 were between 41 and 50 years old and 44 were over 50 years old. secondary and lower, 89 respondents, college, 170, graduates, 124, and more than graduates, 72. Finally, with regard to years of experience, between 1 and 2 years, 106, between 3 and 5 years, 96, between 5 and 10 years, 124 and more than 10 years, 129.

The aforementioned questionnaire was answered online on Google, via a spreadsheet, which was shared by the sample of 455 respondents.

As main conclusions, Zemlyak et al. (2022) found that, companies in the Russian Federation, adopt technological innovations within a broad spectrum of knowledge. Intellectual capital is confirmed as having a key role in this context, and which translates into specialized knowledge, skills and other qualifications that, in companies, constitute assets related to technological innovations. On the other hand, the qualifications of companies to internalize new knowledge, constitute the factor that determines the effectiveness and pace of the same technological innovations.

With regard to the limitations (and future avenues) of the paper, one refers to the fact that it is limited to the transport activity sectors, which limits generalizations. Another refers to the fact that the capacity to absorb technological innovations plays an important role but, this, did not result in evidence in the paper. Finally, the consideration of different activity sectors, as it was not taken into account, constitute an obstacle to comparisons.

Results

Idrus and Hartati (2020), in their research, these 2 authors researched the relevance of the value of intellectual capital in the performance of companies in the transport activity sectors. Other previous studies carried out research on the possible relations between the intellectual capital and financial performance or market value, in the same activity sector, and arrived at different results from those found by these 2 authors. It should be noted that this has been occurring as the intellectual capital began to surpass physical assets as being the most important, in business assets. The same occurs in the transports activity sector, specifically. These activity sectors have a very pronounced influence on economic and social activities. Thus, it is important to know the effects of different measures of intellectual capital on company performance.

The authors used companies listed on the Indonesia Stock Exchange, from 2011 to 2015. With regard to the method used, the research focused on 35 companies in the transport activity sectors in Indonesia, using secondary data from their Financial Statements. On the other hand, they also resorted to primary data that materialized in in-depth guided interviews. In the quantitative approach, the authors used secondary data, and in the qualitative approach, primary data. A total of 21 people were questioned, such as managers, drivers, pilots and regulators. The authors tested 8 hypotheses using multivariate linear regression analysis. As independent variables, they used, VACA (Value Added Capital Employed), VAHU (Value Added Human Capital) and STVA (Structural Capital Value Added) were used as proxies of intellectual capital that was measured via VAICTM by Pulic (1998). The dependent variables used, were ROA (Return on Assets), ROE (Return on Equity), both as proxies of business performance. In terms of final conclusions, the authors demonstrated that VACA, VAHU and STVA did not affect ROA and ROE as proxies of business performance. However, the VAICTM that combined VACA and VAHU and STVA positively affected both ROA and ROE.

Igielski (2018), focuses on the role of intellectual capital in the construction of competitive advantages in the case of transport, shipping and logistics companies located in the Baltic Sea Region. Additionally, the author made an attempt to assess the management of intellectual capital in Polish companies, identifying the conditions that accompany this process.

The basis of the research is an analysis of theoretical materials that were carried out by the author in 2017, encompassing 100 companies, within the scope of an empirical analysis.

From the standpoint of methodology, the research followed a survey that used individual interviews with managers and boards of directors, from 100 companies involving 300 managers and workers in total. The sample was random. On average, each company had between 50 and 249 employees. Only 63 companies used the concept of intellectual capital management. The author found that the companies that employed the most workers were also those that most applied the concept, which was somewhat contrary to what was expected because its implementation and management did not require very complex structures. It should also be mentioned that, in small companies, they were also those in which, due to requiring small structures, the concept was easier to apply, having required less experience. As the main conclusions drawn by the author, the fact that the intellectual capital constitutes a combination and a joint action of all intangible assets that a company owns or is in a position to create using knowledge, is highlighted. The most important thing was to use the potential to be better than the competition. The companies that showed greater effort in these resources revealed that they had the main market precisely in the assets that used these resources. This is important, insofar as companies today work largely on the basis of flexibility and adaptation to change in the environment.

Thus, companies that have built competitive advantages, need to adjust their internal operations to changing external conditions. What is more underlined in the activity sectors, which develop in a dynamic way, as is the case of the transport sectors. In these sectors, for companies to grow, each one has to strive to manage optimally. If these companies plan to increase their efficiency, they must use contemporary forms of management that are used to implement and achieve certain results. Every company should start to see the intellectual capital as the most important factor at the micro and macro level, without which it is not possible to reach a level of innovation. Finally, it is noteworthy that there are dilemmas faced by companies, such as the type of influences from the development of intellectual capital, and the conditions to sustain them afterwards. Recent years have shown, concludes the author, that the concept of intellectual capital has become a management option that has repercussions on the position of companies in the markets, in general.

Gottwald et al. (2017), carry out a sui generis approach, which can be summarized as follows: how can human capital work as a forecasting tool in order to know, in advance, the development of the transport and telecommunications sectors, within the scope of a perspective applied to the context of the Czech Republic, in 2016?

Indeed, the authors state that human capital has gained increasing importance, which translates into the greater number of research studies that highlight human capital as the key in areas that are of utmost importance for development. of countries and companies. On the other hand, it is in the field of education that human capital has the greatest impact.

As the main methodology used by the authors to carry out the research, the starting point was the Department of Transports Management, Marketing and Logistics at the University of Pardubice. A questionnaire was used, conducted among students of high schools, which offered curricular programs related to transport and communications sectors and, at the same time, were associated with the IT, Telecommunications, Postal Services and Logistics High School Association, with the ultimate purpose identify trends in human capital, inserted in the transport sectors.

It is an analysis that has its starting point in 2 identified factors:

• The student´s first intention, that is, looking for a job or extending their studies;

• Students' gender (male or female) about their future. In this context, students were asked in 2 main areas: perceived employability and selected motivational factors, in order to convey an idea about their professional future (first area) and also provide an idea about whether they consider the knowledge and experience held enough for success in the job market (second area);

The questionnaire, carried out on Google Forms, was administered in 2016 to a group of 95 high school students (sample size) aged, approximately, 18 years old. The sample period began on April 4 and ended on April 22, 2016.

With regard to the results obtained, it should be noted that, with regard to perceived employability, they were differentiated according to the students' first intention (looking for a job or continuing to study) and gender.

As the most evident conclusions obtained, it should be noted that a dependence was demonstrated between the first intention of the students, and their differentiation, by gender and by perceived employability and motivation factors. In the case of continuing to study, the difference in answers was higher compared to the case of looking for a job. The paper brought insights into the approach of human capital in the transport and communications sectors.

Avenues for future developments emerged. Thus, one of the topics would be to carry out the study from the perspective of functional relationships and motivational factors, where supposedly, differences by gender would be blurred.

The main contribution of this research was that, in 2016, it constituted the first, based on primary data and, on the other hand, it was the first to be carried out in the Czech Republic.

Ciziunienė et al. (2016) carried out research on the skills of human resources in the transport sectors, specifically through a case study in Lithuania.

The authors begin to assert, right away, that the ultimate goal of any company, is to obtain the greatest profit, the largest market share, and for that, the starting base, are the human resources (intellectual capital). To this end, they emphasize the importance of acquiring skills by them, to be more qualified to perform various functions within companies. In this way, the management of human resources is one of the most important processes, being a sine qua non condition for achieving several goals. When human resources become an active part within the system, then, according to Ciziunienė et al. (2016), these determine the efficiency of activities carried out in business contexts.

In the specific paper, the expression "human resources" and "human capital" are commonly referred to as the latter being more used by economists, while the former is more used in the field of management science.

On the other hand, several benefits are also mentioned due to the fact that investing in human capital is one of the (pre)requisites for it to produce, being developed by market forces. Thus, its development, depends on the investment made in it.

In the case of Lithuania, the weight of the transport sectors amounts to 12% of GDP despite the fact that only 5% of the workforce is active in it. Thus, the transport sectors are the key sectors of the economy and in constant development. The growth in sales in these sectors comes from the growth in demand. According to the data of 2013, from the source of the Department of Statistics of Lithuania, companies in the transport sectors, belong to the one in which the indicators are constantly improving.

Thus, the most important conclusions drawn by the authors are that, human capital is the most important resource of the Lithuanian economy. It is even more important than natural resources and material assets, since satisfying demand is the most important factor in social progress. This is so, because it creates value for companies. Workers are understood not in terms of workforce, but in terms of human capital with accumulated knowledge.

Human resources and their management in companies are, particularly, important in creating value, with the knowledge accumulated during formal education and accumulated experience. Their management and the skills acquired reflect their linkage to achieving companies´ goals. The solutions devised by the management of human resources make it possible to design qualifications for these. It should also be noted that, research consulted by the authors, shows that workers in the transport sectors understand that, value has their skills and the benefits withdrawn to improve professional performance. Having skills to apply knowledge obtained, was understood translated in terms of wage earned.

As future research, the authors state that the requirements for human resources in the transport sectors are increasing qualitatively and not just quantitatively. What will translate into a higher wage, in proportional terms, that is, if the required skills were higher (lower), it will increase (decrease) the concomitant wage.

Conclusion

The main goal of this paper (research) is to know whether, in the relationship between the intellectual capital and the transport sectors, in general, there is any new evidence that highlights anything that proves to be relevant. In other research that relates other topics such as in (Gogan et al. (2016), Hashim et al. (2015) and Kalkan et al. (2014)), namely, the conclusions to be drawn are much more fruitful and, nevertheless, the basic obstacle, alluded to in the introduction, has more substance.

Nothing new is evidenced in this literature review that it is scarce by nature (not only due to a selection effort, attributable to researcher). On the contrary, it is noted that this literature review adopts an approach in which, although the transport sectors topic is present, with regard to intellectual capital, it is completely absent.

Thus, in its replacement, appear expressions such as human resources and human capital. This evidences a basic conceptual definition, disparate and, therefore, prevents a measurement, let alone the concrete value of the intellectual capital inserted in the transport sectors.

The range of expressions and scientific approaches is, in addition to being rare, not very enlightening about the existence of something new between the 2 topics.

It would be expected that there would be quantitative approaches, which would allow transmitting an idea about the value of the transport sectors evaluated by the intellectual capital that it contains. Furthermore, certain relationships that intellectual capital = human resources, have in the transport sectors, namely, for the creation of value (!), combined with the experience held by them, in the case of Lithuania, are not enlightening.

In the case of Zemlyak et al. (2022), we want to know the relationship between intellectual capital as a driver of technological innovation, in the context of the transport revolution that took place in the Russian Federation. The methodological approach is based on the questionnaire and, astonishingly, the respondents in the sample, answered online via Google!. What is the scientific rigor present here? Did the respondents answer or did they ask someone to answer for them? It is a possibility that is not ruled out and, therefore, can make the research prepared by the authors completely unusable.

Idrus and Hartati (2020), they studied the possible relationships between intellectual capital and performance in the transport sectors, in Indonesia. They concluded that intellectual capital (measured by ROA and ROE) is influenced, with positive impacts, by the value added of capital employed, together with intellectual capital, and by human capital and structural capital.

Regarding Igielski (2018), in Poland, to efficiently manage the transport sectors, the essential focus lies in using modern management methods that allow this. Which appeals to intellectual capital, which in turn enables innovation.

Gottwald et al. (2017), address the question of how human capital works as an early predictor of the development of the transport (and telecommunications) sectors in Czech Republic. The underlying sample focused on High School students in this area. Predictability proved to be related to perceived employability, looking for a job or continuing to study and gender.

Finally, Ciziunienė et al. (2016), in Lithuania, related human resources to transport sectors. Those are the most important, as they are a factor of social progress and the creation of corporate value.

Some relevant and new points can be highlighted in the paper, generically:

1. The relations between intellectual capital and the transport sectors do not appear, individualized, as if they were a pair, but rather, related to other topics such as technological innovation, business performance, processes of management of intellectual capital that result in innovation, how human resources function as a predictor of the development of the transport sectors, finally, human resources are factors of social progress and value creation;

2. A non-negligible number of times, expressions other than intellectual capital are referred to, which makes it difficult to select papers that bring together the 2 topics;

3. On the other hand, there is no clear distinction between the transport sectors, by land, by sea and, above all, by air. This, perhaps, is the most important finding, because each type has a different weight and importance in economy. Nothing distinct appears, much less related to intellectual capital;

Regarding to the research question, it was whether the intellectual capital and the transport sector: Do they bring something new, in the substance (content) about the form (the topic(s)) related to the mentioned pair?

Without exception, no other conclusion can be drawn, other than that the papers do not bring anything new, especially useful (see point 2 above), and raise doubts regarding the validity and scientific rigor embodied in them. Thus, regarding the research question: West or East or anywhere between these two extremes, nothing new, neither near nor far.

As main implications, it should be noted that this dual topic is one of the most scarce in terms of scientific work, published by researchers, until now: 2022 and 2016. Therefore, it is not possible to find ideas with potential to expand scientific knowledge, inside and outside the topics, and even less, answers or solutions to problems posed in the papers. The transport sectors are extremely important in economies, but in terms of research it is little or not studied at all.

In the limitations, it can be mentioned, the lack of suitable study, the approaches, do not clearly separate the land, sea and air transport sectors. On the other hand, they do not list the intellectual capital embedded in them (especially in air subsector). For practical application and, following many other topics, they took the intellectual capital as static (instead of dynamic) and as a state not a process.

As future avenues of research, there are studies applied to the most important geographic areas, which will be those where land, sea or air, is more intense and problematic: China, Germany, India, among others. It should also be noted that an obstacle is always faced, translated into very limited information (primary data), but which, for this reason, constitutes a challenge for researchers to overcome and obtain more orange juice.

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