CONCEPTUALIZING A UNIT OF MEASURE OF THE INTELLECTUAL CAPITAL OF IT COMPANIES

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Modern information technology is the main driver of the digital transformation of the global economy, with IT companies being at its innovative core, as studied by O. Starkova and O. Andreichikov (2024). Clearly, it is IT companies that create software products and data infrastructure, develop important technologies such as artificial intelligence and the blockchain, and provide various digital platforms for business and governance. However, what is important to emphasize is that the key to creating value in the IT sector is not so much physical infrastructure as intellectual capital (IC), which includes knowledge, expertise, creativity, social contacts, communication skills, organizational culture and other intangible assets.

Even though IC is obviously important, its structure is still poorly formalized. With no universal ontology of IC, there are limited prospects to manage, analyze, and translate IC into economic value. There are also limitations to the approaches to estimating and measuring intellectual capital, which are mostly based on qualitative methods or summarized financial indicators. Although these approaches provide a general idea of IC, they cannot impartially measure the effectiveness of individual components of human, organizational, or relationship capital, which is thoroughly studied by O. Levit and V. Rogov (2024).

Given the obvious impact of intellectual capital on the performance of IT companies, the task of quantifying and estimating this capital retains its scientific and applied relevance. Therefore, there is a need to create a formalized applied unit of measure for IC, as in the case of the bit for information. Just like the introduction of the bit as a standardized unit of measure was once a fundamental step in the formalization of information theory, which ensured that it could be mathematically treated and widely applied, the introduction of a formalized unit of measurement for intellectual capital will open the way to a new paradigm for managing the intellectual assets of IT companies. Similar to the information bit, such a unit of measure potentially allows for a more complete and accurate formalization of an IT company's intellectual capital as an asset that generates project value, thus creating the prerequisites for more informed management decisions. The unit of measure will also help to standardize different estimation models and move to strategic modeling and building predictive analytical systems integrated into the daily economic, operational, and strategic practices of IT companies.

It should first be noted that intellectual capital is materialized within the IT companies' day-to-day activities through projects, particularly by performing tangible tasks. According to the agile software development practice, tasks are generally estimated in "story points", which are a generic unit of task complexity. Depending on their level of competence software developers or managers are able to perform a certain number of these tasks per unit of time. This is known as "velocity", i.e., the rate at which a particular specialist or team can accomplish tasks. IT teams and individual professionals, as studied by F. Almeida and P. Carneiro (2023), can perform differently in terms of velocity under different conditions. It should also be considered that different projects may adopt a technology stack that differs in complexity and content; one project may use the Java programming language and cloud technologies, while another may use React and Node.js. Different projects may also apply different development methodologies (incremental, iterative or agile models, etc.), which requires the knowledge and skills to practically apply these methodologies. Another important aspect of the context that affects velocity is the interaction with the project team, because its size, content, professional level and the way it is organized can have a significant impact on the performance of each team member. Velocity is particularly affected by how the team is organized; a fully internal team, as is the case with the outsourcing model, tends to have a higher level of consistency and performance, while outstaffing, where developers are integrated into external teams of the customer, may result in lower performance because of more complicated communication, different management approaches and weaker involvement in the corporate culture. Teamwork is also affected by things such as documenting, mentoring, in-house policies and team environment, which can either strengthen or suppress personal IC. Moreover, it is crucial to consider all aspects of interaction with clients, including professional codes of conduct, corporate codes of ethics, and cultural and linguistic diversity, which may determine the overall pace of work on a project; in some cultures the pace is slower and more deliberate, while in others it is faster, with an emphasis on quick decision-making and high rates of task completion. In these settings, each team member is supposed to be able to adapt comprehensively to the pace of task completion, communication models and specific management processes of a particular customer or project environment.

In view of the above aspects related to velocity, and the fact that personal human capital can be differently manifested depending on the context of a particular project, the level of seniority of the specialist and their mastery of a particular technology stack, it can be argued that the personal intellectual capital of each individual IT company specialist has a complex ontological structure that includes as follows:

– Extensional properties, which are manifested in the actual implementation of specific project tasks;

– Intentional properties, which are determined by the specialist's ability, intentions and motivation to adapt to changes in the technology stack and the field of information technology in general in the current project environment;

– Potential or hidden opportunities to implement knowledge and skills in case of significant evolutionary/ revolutionary changes in information technology.

Although the above properties of intellectual capital are highly abstract, this does not rule out the possibility of quantifying them in units similar to story points at different stages of the interaction between an IT company and a specialist. In particular, at the interview stage of the hiring process, the applicant's IC potential is initially assessed through technical tasks and questions that help to determine the level of competence of the applicant. This assessment of a job applicant can be expressed in units similar to story points. Similarly, in the course of work, the profile can be defined more accurately and structured through internal grading systems that allow for the professional stratification of specialists by seniority (junior, middle, and senior) according to the depth of knowledge, expertise, and the level of technology awareness. Lastly, directly implemented project tasks, which are measured in story points and form the velocity values, also allow for a quantitative assessment to be made of the actual contribution of each specialist to the overall intellectual capital of an IT company, but in a more unbiased manner. In this context, story points can be interpreted as an elementary measure of a specialist's ability to create value using their own IC within a particular project.

Thus, velocity can be construed as a primary quantitative indicator of intellectual capital, as it represents the synergy of cognitive abilities, professional expertise, motivational level, and the ability to contextualize within a specific project environment, which is measured in terms of the amount of implemented project functional units, or tasks. In turn, story points, which have been traditionally used to measure velocity in agile project management methodologies, are versatile, proven and widely accepted units to measure performance of IT professionals. The adaptability of this metric to different team structures, technology stacks and project lifecycle phases makes story points appropriate not only for planning and estimating tasks in agile development methodologies but also for strategic analysis of an IT company's intellectual capital.

In view of the above, story points should be considered as a conceptual prototype of the basic unit of measure of intellectual capital, Intellectual Capital Point (ICP). The introduction of the ICP in the IT sector can provide an exceptional opportunity to formalize, aggregate and objectively compare the intellectual contribution of individual specialists, teams and IT companies as a whole, which is critical for making strategic decisions on staff development, forming project teams and evaluating the effectiveness of investments in intellectual assets.

In conclusion, it should be emphasized that the study conducted shows that there is a fundamental possibility of a further more systematic operationalization of intellectual capital, despite it being highly abstract. However, the proposed conceptual unit for measuring intellectual capital, ICP, requires further theoretical development and empirical validation for correlation with other indicators of project success and IT companies in general. The introduction of the ICP is not only a theoretical step toward a more systematic measurement of the IC of IT companies but also opens up significant practical prospects for increasing the transparency, efficiency and competitiveness of IT market players in the era of the knowledge economy.

A priority area for further research is to develop a comprehensive aggregate method for measuring the intellectual capital of IT companies that can integrate the measurement of its elements at the individual, team and organizational levels using the ICP unit of measure. With this comprehensive method of measuring IC, IT companies will be able to switch from an intuitive to a metric-based and analytically driven process to manage their intellectual capital.

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