

Intellectual Capital Statement (ICS): A Case Study from a Hungarian non-profit Joint Venture

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Abstract: An Intellectual Capital Statement (ICS) is a strategic management instrument for assessing and developing the Intellectual Capital (IC) of an organization. The ICS shows how IC is linked to corporate goals, business processes and the business success of an organization using indicators to measure these elements. By identifying the causal relationships between the different types of capital, improvement potentials are discovered, which can then be used profitably for the strategic and operational development of the organization. Therewith, the ICS is an essential tool for preserving the competitive edge and keeping business successful in the knowledge-based economy. The workshop-based approach to creating an ICS helps participants to gain new insights into how their own organization operates. It also provides concrete results in the form of prioritized recommendations for action to foster their organization's sustainable development and consistent reporting. Against this background, a case study to outline selected essential steps of the ICS creation for an applied research a non-profit joint venture for computer science and control in Budapest is presented.

Keywords: Intellectual Capital Statement, ICS, Intangible Resources, Case Study

1. Introduction

In an environment characterized by globalization, technologization and increasingly shorter product life cycles, knowledge advantages are the decisive competitive advantage in many areas. To respond to this challenge, innovative companies have started to focus on intellectual capital reporting and to identify and develop their critical intellectual capital, ultimately putting it to good use. The pioneers of intellectual capital reporting showed as early as the 1990s that the targeted recording of intellectual capital opens up additional potential for success. Ordinary balance sheets do not constitute a sufficient instrument for this, as they merely reflect the financial and material past of the organization. Intellectual capital, such as the specialist knowledge, experience and creativity of employees, efficient processes, intellectual property or important relationships with customers and partners, are hardly considered. However, precisely in these elements lies Germany's future potential and opportunities for development as an innovation location.

The great success of companies whose value creation is based primarily on intangible production factors such as knowledge and experience highlights the limits of traditional, financially oriented company valuation. In the search for explanations, experts agree that the success of these companies is largely dependent on their intellectual capital. However, there is little or no reliable data available on these intangible assets in most organizations, which results in uncertainty about investments in the latter. An even more important argument for measuring and valuing intellectual capital is the possibility of making these "soft factors" accessible to systematic management. In many cases, the management of these factors is left to the intuition of individuals. In small and medium-sized organizations, this is usually the "boss" who guides the company's fortunes with his intuition. However, if the companies have reached a certain size or if there has even been a change in management, for example due to a succession plan, this can lead to manifold problems. In these situations, methods and tools for the systematic management of relevant intangible corporate resources are extremely useful.

As a management and communication tool, the intellectual capital statement aims, on the one hand, at the systematic internal control of intangible value drivers. Management and organizational development receive a well-founded decision-making basis for the implementation of development measures (Mertins et al. 2005). In addition, the intellectual capital statement functions as a reporting instrument that can be used for both internal and external communication of the company-specific intangible values (Will et al. 2007).

2. Methodology

The intellectual capital statement constitutes a report on the valued intellectual capital of an organization and on current, completed and planned measures for its development. Intellectual capital refers to all intangible

factors important for business operations and their interconnectedness. The differentiation between three types of intellectual capital has become the standard: Human, structural and relational capital.

The model of the "Intellectual Capital Statement - Made in Germany" of the Intellectual Capital Statement Working Group ("Arbeitskreis Wissensbilanz") consists of three sub-models: the organizational model, a business process model and the control model. Based on a systems theory assumption, the company is embedded in a business environment in the organizational model. Vision, business strategy and business success form the initial situation of the intellectual capital statement model. In the business process model, intellectual capital (human, structural and relational capital) is captured in the context of business processes. In the control model, a control loop is assumed between the status quo of the intellectual capital, the processes, their effects on the results and the strategic goals (Alwert 2006).

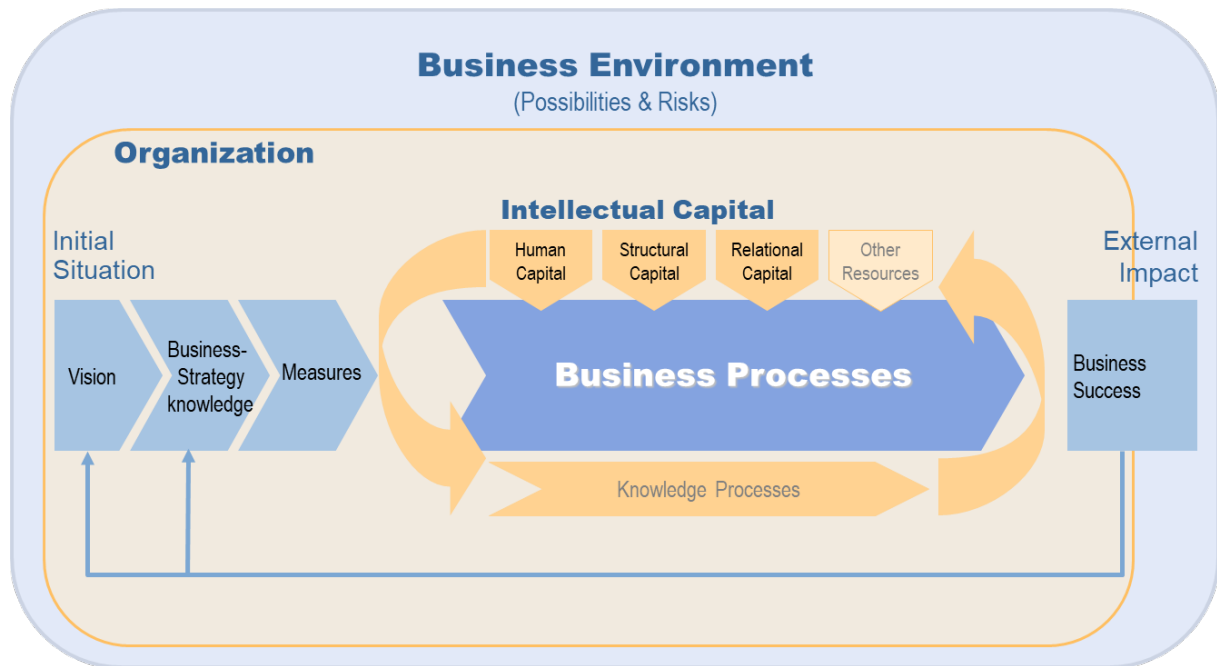


Figure 1: Model of the "Wissensbilanz - Made in Germany" (Alwert et al. 2004)

The method described here was developed by the intellectual capital statement working group initiated by Fraunhofer IPK in the pilot project "Wissensbilanz - Made in Germany" with regard to the requirements of medium-sized companies (first published in Alwert et al. 2004). Based on existing concepts from other European countries (overviews can be found in Mertins et al. 2005; Alwert 2006), a simple, systematic procedure model was implemented and practice-oriented interpretation aids for an efficient management of intellectual capital were tested and optimized. The intellectual capital statement is implemented in the company through a series of workshops with a cross-functional and hierarchy-wide intellectual capital statement team. This procedure ensures a holistic view of intellectual capital in the company (Mertins et al. 2005; Alwert 2006; Alwert et al. 2008). The supporting software "Intellectual Capital Statement Toolbox" (Mertins, Will 2007) breaks down the procedure for intellectual capital reporting into eight simple work steps.

At the beginning, the business model of the reporting company is described. This involves documenting information on the business environment (opportunities and risks) and strategic objectives (step 1), which form the basis for assessing the soft success factors in all further steps. Against the background of the strategic goals and the business success to be aimed for, the performance processes that are decisive for the business success are determined and influencing factors of intellectual capital are identified in the categories of human, structural and relational capital (step 2). The various factors of intellectual capital can be defined individually for each company. The evaluation of the current expression of all influencing factors in comparison with the strategic objectives is carried out with regard to the criteria of quality, quantity and systematics (step 3) on a predefined percentage scale. Qualitative justifications for the individual evaluations are to be discussed and documented in the intellectual capital statement team. This workshop-based self-assessment is substantiated in the next step by determining indicators for measuring intellectual capital in the form of facts and figures (step 4). After assessing and measuring the strengths and weaknesses of intellectual capital, the workshop participants analyze

the impact relationships between intellectual capital, business processes and business success (step 5). Based on the sensitivity analysis according to Vester (2003), this enables statements to be made on the individual influence weight and controllability of individual factors as well as on time lags in the effect of measures. The central result of the evaluation (step 6) is the potential portfolio, in which the evaluation of the factors is presented together with their influence weight. This makes it possible to see at a glance which factors need to be developed due to their high impact on the overall system and their relatively low rating. Once urgent fields of action have been identified, corresponding measures can be defined (step 7). The preceding steps ensure that these measures support the achievement of the strategic goals and have the greatest possible leverage effect. Finally, the intellectual capital statement toolbox enables the creation of the finished intellectual capital statement document at the push of a button (step 8). For communication to selected target groups, such as employees, customers and lenders, the content can be selected, combined in a document and processed further.

3. Implementation of ICS at a Hungarian non-profit Joint Venture

This contribution aims to describe the process of creating an intellectual capital statement (ICS) and selected results of this process for a Hungarian non-profit joint venture. Therefore, the key steps 1-3 of developing an ICS, key issues of the case and their analysis as well as recommendation are outlined. These are based on the results of an on-site workshop with a representative group of the organization (researchers from all service areas and strategic management) conducted in September 2021.

Before the intellectual capital statement was carried out, initial preliminary and informational talks were held with the strategic management of the organization, in which the method of intellectual capital statement was presented. As a basis for the decision on the implementation of the intellectual capital statement the "Fitnesscheck- Wissensbilanz" was carried out. As a result of this quick test, the suitability of the organisation for the implementation of the method was approved. After the official commissioning of the intellectual capital statement by the management, a project plan was agreed upon, which was based on the criteria and milestones of the guidelines (BMW, 2008) for the preparation of an intellectual capital statement. The individual work steps were fixed in terms of dates with the company management. At the kick-off, the project plan and the method were presented to the employees. The further work steps were carried out by the creator of the intellectual capital statement, the management and the project team. Since the commissioning of an external person for the moderation of the workshops was not possible for economic reasons, this moderation was also carried out by the creator of the intellectual capital statement.

The project team that took part in the workshops consisted, as suggested by the guidelines (BMW, 2008, p.11), predominantly of active persons from various service areas. Representatives from all parts of the company and from all hierarchical levels were involved as recommended by the AK-Wissensbilanz (BMW, 2005, p.17), to ensure appropriate "grounding". After the preliminary meeting, a project team was appointed. This consisted of researchers and students from the various service areas as well as the strategic management. The participation of the top management as members of the project team was considered very important, as their knowledge of the process flows as well as their active cultivation of success-critical contacts with the business environment were essential foundations for the effective implementation of the workshop. Since all the people working in the practice see themselves as "experts at eye level" and interdisciplinarity is seen as an important part of the company, the involvement of the top management had an overall positive acceptance by the employees.

In the course of the preliminary discussion, the participants were made aware of the basic criteria for the success of the project as described by Mertins & Alwert et al. (2005) and the AK-Wissensbilanz (BMW, 2005, p. 13). These are an abolition of the hierarchical principle, consensus orientation, argumentative appreciative forms of discussion as well as transparency on all levels during the entire implementation process.

3.1 Description of Business Model

In the course of the business model work step, a preparatory meeting with the company's management lasted several hours. In this regard, guiding questions of the guideline prepared by the AK Wissensbilanz (BMW, 2005) were used. For the documentation of the data the software 'WB-Toolbox' was used. The learning program integrated in the software was deployed in order to explain terms and definitions more clearly to the project team. Subsequently, the business model of the Hungarian non-profit joint venture was revealed.¹

¹ Due to data protection reasons, in this paper only facts and figures that were approved for publication by the top management of the Hungarian non-profit joint venture are incorporated in the business model description.

The joint venture with acknowledged researchers supports companies in creating innovative solutions by conducting R&D work in the industrial environment. Its mission consists in supporting the process of the digital transformation and the implementation of the Industry 4.0 concept with its research, development and consulting services. Its service portfolio covers digitization, big data analytics, robotics, artificial intelligence, with a strong focus on the optimization of production and logistics systems. This includes the newest IT solutions and services for the manufacturing and logistics processes as well as the inter-connected industrial hardware and software systems, called Cyber-Physical Production systems. The joint venture aims to become the most recognized organization for production informatics in Hungary in the short- to mid-term by transferring state-of-the-art scientific results into innovative industrial applications. Therewith, one major and critical challenge is to keep the quality of research results on a sufficient level to subsequently turn them into applicable solutions that are easy to integrate into the customers environment. The organization aims to establish its scientific role within the Hungarian innovation ecosystem as well as international presence, aiming for international customers. Currently, new promising technological fields of actuation have been discovered, and the product portfolio has been diversified according to market demand.

The general value creation model of the non-profit joint venture consists of four levels and several factors per level. The following figure shows the general factors corresponding to the four Levels

- Business Success,
- Customer Value,
- Business Processes and
- Intellectual Capital / Resources (Human / Structural / Relational Capital).

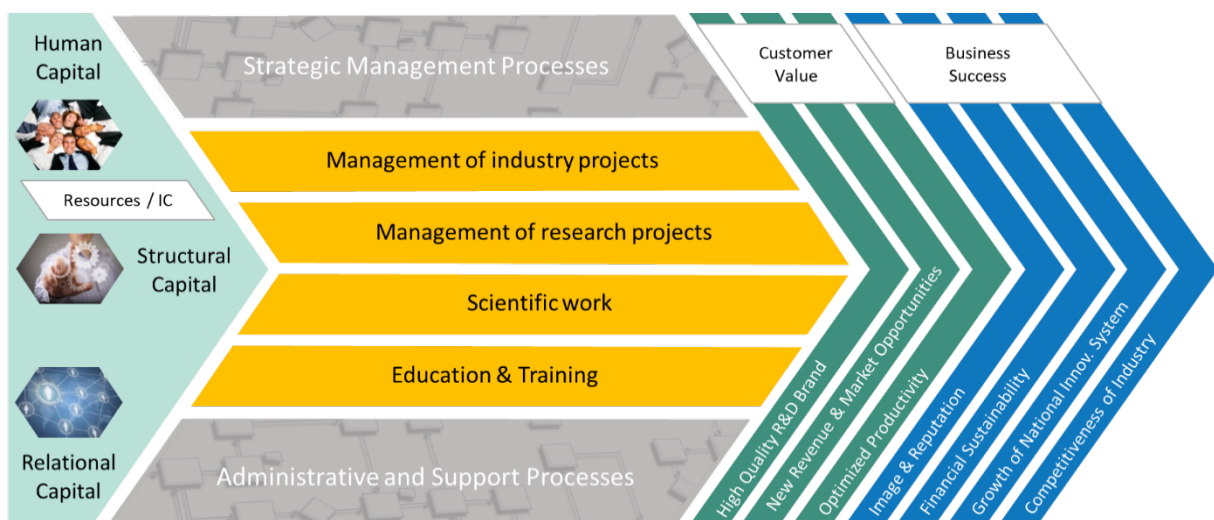


Figure 2: General Value Creation Model of the Hungarian Non-Profit Venture

Business Success is subdivided into the factors Image & Reputation, Financial Sustainability, Growth of the National Innovation System and Competitiveness of the Industry. The Customer Value that the non-profit venture aspires to generate can be sub summarized into High Quality R&D Brand, New Revenue & Market Opportunities and Optimized Productivity. The Process Level is categorized by the Value Adding Core Processes, which are Management of Industry Projects, Management of Research Projects, Scientific Work, Education & Training. The categorization of Resources follows the definition of Intellectual Capital, which is outlined in the following.

3.2 Determination of the influencing factors of the intellectual capital

The Strategic Success Factors are the drivers of the Value Creation Model, i.e. the tangible and intangible resources that are used to execute the defined business processes in order to produce the defined results on the Levels “Customer Value” and “Business Success”. Therefore, they are the basis to identify the relevant gaps. The organisation’s “Resources / Intellectual Capital” are described through the nine Strategic Success Factors that are grouped into the three different Levels: Human Capital, Structural Capital and Relational Capital. The following tables show the definition of each factor by objective level.

Table 1: Human Capital Factors

Objective Level	ID	Factor	Definition
Human Capital	HC 1	Strategic Orientation	The competence of the management staff to set-up, communicate and follow-up on the strategy as well as the knowledge about the strategy among employees and the systematics to set-up and implement strategies.
	HC 2	Professional Competence	The technological and research expertise of the E staff as well as the ability to execute applied R&D and innovation projects and the systematics to build up the necessary competencies.
	HC 3	Communication Competence	Competencies of the staff to communicate and sell its services and products to potential customers as well as the systematics to build up these communication and sales skills.

Table 2: Structural Capital Factors

Objective Level	ID	Factor	Definition
Structural Capital	SC 1	Technology & Knowledge Management	The structures, systems and procedures to acquire, store and disseminate information and knowledge about relevant technological, market related and organizational topics (developments) as well as the systematics to set-up and improve these systems.
	SC 2	Organization & Management	The structures, systems and procedures to manage, run and support the core processes and operations as well as the systematics to develop and improve the organization & management.
	SC 3	Scientific-Technical Equipment	The structures, systems and procedures to select, acquire, install, operate and maintain the facilities and equipment.

Table 3: Relational Capital Factors

Objective level	ID	Factor	Definition
Relational Capital	RC1	Relationship to Industry	The relationships to companies and potential clients in the focus market segments as well as the systematic procedures to build-up, develop and maintain these relationships.
	RC2	Relationship to Science / R&D	The relationships to partners and the scientific community as well as the systematic procedures to build-up, develop and maintain these relationships.
	RC3	Relationship to External Sources	The relationships to external sources of funding and relevant public bodies / agencies / governmental institutions and private sector funding programs as well as the systematic procedures to build-up, develop and maintain these relationships.

3.3 Evaluation of the influencing factors according to the dimensions quantity, quality and systematics (QQS-evaluation).

Through a workshop with the project team, the identification of the factors influencing intellectual capital and the evaluation of these factors according to their characteristics in the dimensions of quality, quantity and systematicity (QQS), as envisaged by the “Arbeitskreis Wissensbilanz” (BMWA, 2005), were carried out. In this regard, the participants were provided with information material on the essential steps and technical terms by e-mail prior to the workshop in order to keep the time for clarification of terms short on the day of the workshop.

Subsequently, the nine factors of the intellectual capital were assessed using the QQS – assessment. This constitutes the basis for a profile of strengths and weaknesses, according to the Arbeitskreis Wissensbilanz (BMW, 2008). The influencing factors are evaluated according to quantity, quality and systematics. Thereby the project team had a rating scale of 0 - 120 % at its disposal. In this context, the Arbeitskreis Wissensbilanz (BMW,

2008) recommends evaluating in 30 % steps. According to Bornemann & Reinhardt (2008), the goal of this evaluation system is to be able to clearly distinguish between those factors that already support the strategic goals very well and those that need to be improved. The value of 120% is intended to give participants the opportunity to express that too much of this influencing factor is already present in order to achieve the goal. No use was made of this scoring option in the QQA assessment conducted.

The results of the QQS assessment are presented in the following figure as a QQS portfolio. Simon & Gathen (2002, p. 35) describe portfolio analysis as a portfolio management tool, which intends to show the current status of success-critical potentials and thus allows conclusions to be drawn about strategic development measures. The Arbeitskreis Wissensbilanz (BMWA, 2005, p. 27) describes the QQS portfolio as a form of representation of the previously made percentage assessments in a coordinate cross. While the x-axis represents the quality, the quantity is represented on the y-axis. The percentage estimation of the systematic is represented by the size of the circle area. According to the criteria of the intellectual capital statement working group (BMWA, 2005), those influencing factors that are located in the upper right quadrant are well developed. Small circles, on the other hand, show deficits, because it can be assumed that a weakly developed system to develop the influencing factor leads to a deterioration of this factor in the long term. The interpretation of the created QQS-portfolio of the Hungarian non-profit venture is summarized in the following.

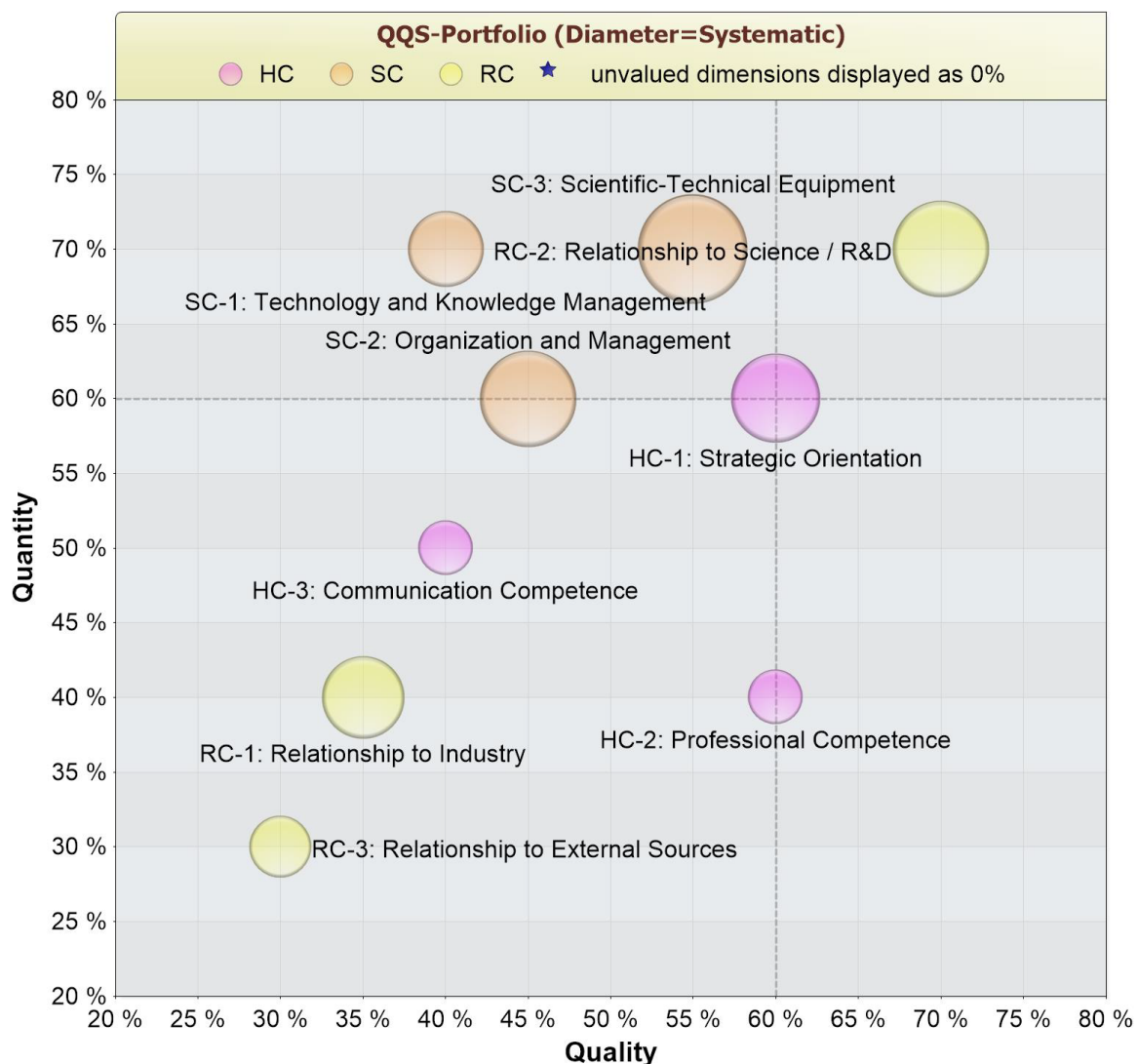


Figure 3: Actual status (strengths and weaknesses) of the Strategic Success Factors of the Hungarian non-profit joint venture (own representation based on BMWI, 2008)

3.4 Human Capital

3.4.1 Strategic Orientation (HC-1)

There is a lack of people carrying out strategic tasks, clearly working towards the vision and mission of the organization. Strategic meetings to support strategic thinking of the workforce are rare, there is no capacity to focus on strategy development, because the employees are loaded with operational tasks. However, the employees possess sufficient strategic competences. A strategy is in existence, but rather implicit - it is not sufficiently communicated. Currently there are no effective ways to communicate and share information. The quality of the strategic objectives is decent, however they need to be refined and revised. There's no clear systematics to further develop the strategy. This underlines the need for annual meetings (refining strategy according to changing requirements, strategic objectives & breaking them down into operational tasks). In addition, it became clear that there is a lack of a comprehensive competitor and market analysis to gain more insights into the concrete market demand for the organization's solutions.

3.4.2 Professional Competence (HC-2)

Current professional competencies are not sufficient to achieve strategic objectives. More professional competencies and technical expertise are needed, especially in the field of IT development. The number of employees is not sufficient in the light of the current size of the organization. In many cases, employees possess the needed competencies, but need to be "convinced" to carry out the respective tasks as well as to attend trainings and learn ("resistance" to changes). Trainings are executed when needed, rather 'on impulse' than systematically. It became clear that new competence profiles are needed for future activities / projects (e.g. Blockchain), which is reflected in a rather low quantity result (40%).

3.4.3 Communication Competence (HC-3)

There are employees with adequate communication competence (e.g. to the customer, supported by using presentations in English) among the team. The amount of communication competence for international funding bodies could be improved. In many cases there is a lack of internal communication competence (e.g. Developer talks to managing director). While the needed language skills are sufficient, there's a lack of communication competence to convince potential clients, negotiate and acquire new projects. No systematics for trainings to improve communication competence are in existence. Trainings are offered from time to time, but more executed on impulse or on demand. On the other hand, a new website, regular newsletter, LinkedIn, Facebook & online ads constitute more systematic communication channels to the customers.

3.5 Structural Capital

3.5.1 Technology and Knowledge Management (SC-1)

Sufficient access to acquire knowledge (e.g. Via scientific journals) is given across the organization. Tools are in existence (e.g. Cloud, internal servers, wiki) to store, share and disseminate knowledge. A kitchen and "playroom" are available to support the exchange of informal information among the team members. Existing tools for acquiring, storing and disseminating knowledge are sufficiently working, however they are not integrated and possible interfaces are not aligned. In some cases, the handling of tools is complicated and hard to understand ('how to use it?'). Individual employees are not giving insights into their gained knowledge (e.g. after sighting papers / articles). To gain insights about projects, there is no standard procedure in place ('where can I find the information I need?'). Research and project results are a lot of times not sufficiently documented and communicated, there is a need for regular (mandatory) meetings to share gained knowledge. In some cases, employees leave the organization with their knowledge.

3.5.2 Organization & Management (SC-2)

There is a lack of tools regarding resource planning and project management, however the introduction of new tools could add more complexity and prevent employees from their actual and important tasks. Moreover, there are quality issues with the controlling software in use. The outcome of this software is vague in some cases, actual available numbers and figures are needed (e.g. about project results, budgets, etc.) or can be hard to find. Administrative and support processes need to be clearly defined and systematically developed.

3.5.3 Scientific-Technical Equipment (SC-3)

The overall maintenance for machinery is lacking. Employees are capable and in charge of maintaining basic working equipment, however there are no related standard procedures put into practice. There is a purchasing

department dedicated for the acquisition of new scientific-technical equipment | existence, however a variety of regulations lead to long waiting times even for smaller orders, which have to be checked against the annual procurement plan. An internal Wiki contains valuable information regarding handling of equipment, but is not used sufficiently among the employees. Standard processes to teach new employees, including students on machinery are sufficient.

3.6 Relational Capital

3.6.1 Relationship to Industry (RC-1)

There is a huge lack of valuable relationships to large companies. Lots of contacts (small – and medium-sized companies) are aggregated in a CRM database. However, relationships cannot be turned into actual projects. Moreover, the quantity of people (esp. Sales) to build up and manage relationships to externals are not sufficient. This connected to a lack of systematic communication (e.g. regular calls to the industry). Recent developments are going in the right direction: Newsletters, events, social media, systematic online advertising / marketing (analytics tool) are implemented. Solutions are not systematically matched with industry demands (e.g. collecting ideas to approach potential clients and their problems / demand).

3.6.2 Relationship to Science / R&D (RC-2)

Decent relationships to relevant international R&D organizations and very strong international relationships to universities and other scientific institutions, partners etc. are in existence. However, there are no clearly defined responsibilities and procedures to maintain and support these relationships. Moreover, the relationships are to a certain extent 'unbalanced'. Specific partners and organizations are favored, while others are neglected. In some cases, there is not enough capacity / time to actually create papers and attend conferences to build up and maintain relationships.

3.7 Relationship to External Sources

There are strong and valuable relationships to the European commission and local ministries in existence. There is a systematic approach to maintain the relations to the European commission, e.g. through regular checks of new funding calls, events, meetings etc. However, more capacities (people) are needed to manage and further develop these relationships.

4. Conclusion

In this contribution, the process of implementing an intellectual capital statement within a knowledge-intensive applied research organisation was outlined, focusing on the systematic recording and evaluation of intangible influencing factors of the internal resources. Due to individual definitions of the respective influencing factors, the relevance of the contents in this method can be rated highest. The systematic identification of weaknesses and the detailed analysis of the interdependencies of effects as well as the measures derived from them support the implementation orientation. The workshop-based self-assessment of intellectual capital enabled a high degree of participation in the analysis and the derivation of fields of action. In addition, the representative composition of the workshop team ensured compatibility with the organizational structure and culture. The results can also be easily transferred to existing management systems. However, effective moderation by trained experts is necessary to ensure the quality of the results and, at the same time, a low level of effort. Strategy-oriented monitoring can be derived from the intellectual capital statement, but the procedure does not yet sufficiently support the continuous tracking of measures in intra-year cycles.

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