



THE INTELLECTUAL CAPITAL METHOD: APPLICATION TO THE KOŠICE REGION IN SLOVAKIA

(METHODOLOGY DESCRIPTION – DESCRIPTION OF THE METHODOLOGY
OF INTELLECTUAL CAPITAL MANAGEMENT FOR SMES DEVELOPED BY
PROJECT PARTNERS WITH RELEVANCE TO THE SLOVAK CONTEXT)

Result 2
of the LLP Leonardo da Vinci
LEGEND project

centire



FH | JOANNEUM
University of Applied Sciences

WISSENSKAPITAL

Abstract

This paper forms part of the Result R2 “Methodology description – Description of the methodology of intellectual capital management for SMEs developed by project partners with relevance to the Slovak context” which was due on 31 March 2014.

Suggested citation

Respective author(s) of the chapter (2014), in: The intellectual capital method: Application to the Košice region in Slovakia. A result of the project: “Leverage knowledge for sustainable innovation and growth” (LEGEND), edited by Olejárová, D., European Commission – Life-long Learning Programme, Brussels: Education, Audiovisual and Culture Executive Agency.

JEL classification: J24, O11, O32, O34

Date: 31 May 2014

LEGEND result: 2

Editor: Daniela Olejárová

Authors: Ľubomír Billý, Miriam Brašková, Christian Friedl, Viera Holešová, Mart Kivikas, Roswitha Wiedenhofer

Reviewed by: Prof. Guenther Koch

Lead partner: Centire

Contact person: Daniela Olejárová

Centire

daniela.olejarova@centire.com

+421 902 900 762

TABLE OF CONTENTS

1. Chapter 1: Rationale and justification for using IC method in the Košice region	4
1.1. Applicability of IC method to small and medium-sized companies in the Košice region	4
1.2. Applicability of IC method to other partners in the Košice region	4
2. Chapter 2: Analysis of the Košice region according to the IC model.....	6
2.1. Introduction of the Košice region	6
2.2. Rationale for applying the IC method to the Košice region.....	7
2.3. Analysis of the Košice region on the basis of the identified IC factors	8
3. Chapter 3: Adapting IC method to the Košice region.....	15
3.1. Introduction	15
3.2. Perspective of small and medium-sized enterprises.....	16
International perspective – the German experience	16
Local Perspective – small and medium-sized enterprises from Eastern Slovakia.....	18
3.3. Perspective of higher education institutions	19
International perspective – the Austrian experience.....	19
Local perspective – recommendations for higher education institutions in Slovakia.....	24
3.4. Perspective of other regional partners.....	30
International perspective – the German experience	30
Local perspective – other partners from the Košice region	32
4. Chapter 4: Recommendations for the Košice region.....	35
4.1. For small and medium-sized enterprises	35
4.2. For higher education institutions	36
4.3. For other regional partners.....	38
5. List of annexes	39

1. CHAPTER 1: RATIONALE AND JUSTIFICATION FOR USING IC METHOD IN THE KOŠICE REGION

1.1. APPLICABILITY OF IC METHOD TO SMALL AND MEDIUM-SIZED COMPANIES IN THE KOŠICE REGION

Author: Mart Kivikas, Wissenskapital

Soft factors like company culture, leadership, skills, customer relations and internal communication are usually factors, which are more important for business success when a business is smaller. Nevertheless, in the current system of accounting there is no room to evaluate these factors. The selected intellectual capital (IC) method is today the most used method to evaluate these factors in Europe. Although developed in the German speaking countries, it has also been used in countries like Spain, Poland, the Netherlands and now Slovakia. The IC factors have been selected as being the most relevant ones for use since 2003 when the IC method was developed. Moreover, use of the same definitions creates space for benchmarking. However, an adaptation of the method to the local standards and language is always recommended and thus it is also part of the LEGEND project.

In the world where market conditions change rapidly, a small and medium-sized enterprise (SME) may have to change its business model within a couple of months. The reason may be an economic downturn caused by heavy economic losses in the USA between 2008 and 2009 in which Košice SME had no stake, but which influenced them. Another example can include a loss of a big account customer which decides to move all business outside Europe. A bigger company usually has more resources to identify these trends early enough and has better connections to banks and politics. A local small and medium-sized company, on the contrary, cannot afford this.

Therefore, the intellectual capital statements (ICS) of SMEs must focus on what they can influence. This should include mainly their internal organisation and partially also their customers and suppliers. The ICS visualizes these factors and how they correlate to the company business success. It is thus of great importance to provide an entrepreneur with an agenda containing a short list of priorities for management action points. With a toolbox, those IC factors and the decided action points are put on paper which makes them possible to control and monitor whether or not the identified actions have a positive effect on the results. **The LEGEND project provides a unique effort to bring the IC method to Slovak SMEs as a tool that could be used in small business development, consulting and/or professional training of SME managers.**

1.2. APPLICABILITY OF IC METHOD TO OTHER PARTNERS IN THE KOŠICE REGION

Author: Roswitha Wiedenhofer, FH JOANNEUM, University of Applied Sciences

Today universities are facing several big challenges. Decreasing birth rates in some parts of Europe, new emerging markets of students in BRIC countries, increasing competition for students, budgets and research funds, new digital forms of learning and teaching styles (...) also challenge the management of higher educational institutions and imply adaptations in planning, organizing and profiling – generally spoken in its strategies and future design.

It was already in the 1990s that certain awareness for some reforms within the higher educational sector (at least in German-speaking countries) emerged. “New Public Management” approaches form the theoretical background for a strengthening of decentralized freedom of action and at the same time implementation of performance-based steering instruments at universities. New forms of organization and legal structures evolved and multifold indicators were implemented due to the increased autonomy level of HEIs that now have to manage their own affairs.

For years now, the significance of strategic management at higher educational institutions has been increasing. Although it is quite evident that “classical” strategic management approaches do not work in this specific type of organizations – as it is potentially suggested in checklists and process charts of management handbooks – HEIs’ main inputs and outputs are intangibles that are not accordingly measured by traditional accounting systems (Leitner et al., 2013, p. 9).

This is based (among others) on the fact that the management of universities always has to handle the “balancing” act of steering an autonomous body in terms of freedom in research and teaching (and corresponding culture and structures, e.g. the academic council) and a mostly big enterprise with several strong groups of stakeholders at the same time. That means that a high degree of participation in decision structures and a stakeholder-oriented and integrative management style is important for the acceptance of overall strategies. Therefore, a common understanding and common university-business-model-oriented language of all stakeholders (internal as well as external) is a necessary prerequisite for any further organizational development.

Since a sustainable competitive base within a region is only given by a good interaction of different actors of a regional innovation system, this “language” must also be transferable and exhibit suitable interfaces to other external actors – such as companies, public and policy institutions. The increasing level of cooperation between HEIs and businesses also contributes to this. **The chosen IC approach serves this purpose and can be transferred to and between the different actors within an innovation system.**

Further on HEIs are outstanding in terms of importance of qualified staff and its competences which by far excel the importance of any other tangible resource. A sole balance sheet will not be sufficient as means of presentation and basis for steering such resources. Leitner et al. (2013, p. 9) lists some additional reasons for HEIs to get involved with ICR:

- HEIs are operating in a non-profit environment and IC management helps them to adapt their university management focus to the needs of this environment and to depict & acknowledge their intellectual resources in a better and structured way.
- The measurement of HEIs in the sense of ICR could help HEIs to open themselves to the broader public and to get rid of the old “ivory tower” image.
- Human Resource Management (HRM) is an important success factor for organizations from different sectors. Especially for HEIs, it is important to provide an adequate environment that supports the creativity of their staff and students. ICR addresses these organizational factors by assessing the structural capital.

Thus the concept of Intellectual Capital and suitable driving factors and/or indicators is genuinely suitable for those knowledge intensive, stakeholder-oriented institutions, which serve, develop and “produce” the new knowledge professionals for our society.

References

Leitner, K. H./Elena-Perez, S./Fazlagic, J./ Kalemis, K./Martinaitis, Z./Secundo, G./Sicilia, M.-A./Zaksa, K. (2013): A Strategic Approach for Intellectual Capital Management in European Universities: Guidelines for Implementation, Research Paper, 2013

2. CHAPTER 2: ANALYSIS OF THE KOŠICE REGION ACCORDING TO THE IC MODEL

Authors: Lubomír Billý, Viera Holešová & Daniela Olejárová, Centire and Miriam Brašková, Košice IT Valley

2.1. INTRODUCTION OF THE KOŠICE REGION

Throughout this report “the Košice region” is mentioned as a geographical scope of the main impacts expected to be achieved through implementation of the LEGEND project. However, it is important to provide a detailed explanation concerning the region which is subsumed under the generic term of “the Košice region”. The Košice self-governing region is the second largest by population after the neighbouring region of Prešov. It is the fourth largest region of the Slovak Republic by surface area. Historically it lies on the territory of the regions of Spiš, Gemer, Abov and Zemplín and together with the Prešov region they form the region of Eastern Slovakia. The city of Košice is the administrative, cultural, educational and political centre of the region. It is the Slovakia's second largest city with a population of 240,000 which represents a third of the population of the region. The Košice region has 440 municipalities, of which 17 have received the town status. The population reached a total of 794,025 inhabitants in 2012, representing thus 14.7% of the total population of Slovakia.

From a territorial perspective, the Košice and Prešov regions are understood to be separate territorial units – two out of the total number of eight self-governing regions in Slovakia. However, when taking into consideration broader regional development, the Košice and Prešov regions are often being viewed as a single unit because they share similar features, structures and regional development indicators. **Therefore, in the LEGEND project, the term “Košice region” will include primarily information on the Košice self-governing region but also relevant data on the Prešov self-governing region if applicable.**

Figure 1: The geographical scope of the “Košice region” in the LEGEND project (includes partially also the Prešov self-governing region) – highlighted in red colour¹



2.2. RATIONALE FOR APPLYING THE IC METHOD TO THE KOŠICE REGION

As presented in the previous sections, the intellectual capital method is used widely by higher education institutions, small and medium-sized enterprises or research institutions internationally. In general, the intellectual capital consists of the identified types of capital (human, structural and relational). Each of them comprises a set of relevant factors that can be considered crucial for innovation growth. The set of the driving factors within a system or a region combines a micro and a macro view. In such a case the innovating organization represents the “micro” world and the environment the “macro” environment. Therefore, in the following section our focus will be to present the “macro” perspective on the Košice region and its analysis from a vantage point of the intellectual capital factors.

In the process of preparing the regional analysis, initially, the relevant factors were selected on the basis of Wiedenhofer (2012) by representatives of the project partners, namely Wissenskapital and FH JOANNEUM. Subsequently, the information on the Košice region was compiled by Centire and Košice IT Valley. It is important to note that the regional analysis was conducted in parallel with the national analysis of Slovakia which served as a background material (for details see Annex 1). The analysis of the national context was developed in close collaboration with Jan Papula and Jana Volna from the Faculty of Management of the Comenius University in Bratislava.

Since the main project aim is to contribute to the increased use of knowledge by SMEs in the Košice region, the main focus was on identifying the adequate resources when developing the analysis. It provides an up-to-date and comprehensive overview of data regarding the innovation status of the Košice region and its development potential. This information provided a basis for adjusting the IC method to the local context of the Košice region which is presented in Chapters 3&4. The regional analysis of the Košice region comprises the following factors within the three main types of IC capital:

¹ Source: <http://www.kranimex.sk/new/vychodne.gif>

Human capital

- Qualified staff on the regional labour market
- Professional expertise (of potential employees) / educational standards
- Leading figures and stakeholders

Structural capital

- Technical framework
- Scientific facilities
- New technologies
- IP Rights
- Innovation and R&D budget within the company
- Geographic proximity of organisations
- Internationalisation
- Trust, conventions and cultural aspects
- R&D funding (programmes)
- Institutions for knowledge transfer and support
- Traffic facilities and local public infrastructure
- Organisational structures for R&D and innovation

Relational capital

- Cooperation with economic partners
- Cooperation with university partners
- Cooperation with funding institutions from the private as well as public sector
- „Weak ties“ (suggested focus on the cooperation of the region with others)
- Relations to national governmental institutions and policy makers

References

Wiedenhofer, R. (2012): 'Key drivers of technological innovation: intellectual capital view approach', Int. J. Transitions and Innovation Systems, Vol. 2, Nos. 3/4, pp. 283–301

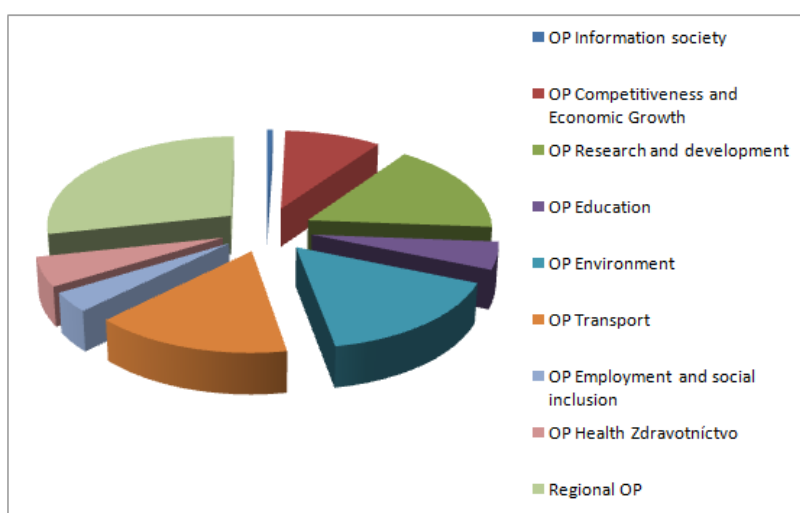
2.3. ANALYSIS OF THE KOŠICE REGION ON THE BASIS OF THE IDENTIFIED IC FACTORS

	FACTOR	DEFINITION	DATA
H U M A N C A P I T	1. Qualified staff on the regional labour market	<p>This factor describes the available number and the relevant qualification of specialised staff available on the regional labour market.</p> <p>To achieve this, a sufficient number of educational institutions in the region, which offer a corresponding study</p>	<p>Except primary and secondary schools in the Košice region, there is a cluster of strong universities located in the city of Košice – Pavel Jozef Šafárik University, Košice University of Technology, Theological Faculty of Catholic University in Ruzomberok, University of Veterinary Medicine, Faculty of Business Economy of the University</p>

T A L		programme, are necessary.	of Economics in Bratislava and the private university – Vysoka skola of Security Management. Students have opportunity to choose from more than 300 different study programs.
	2. Professional expertise (of potential employees) / educational standards	For planning and implementation of innovation and R&D projects, a sufficient number of specialized employees are necessary in the companies. For a long-term commitment of employees and the development of a pool of skilled personnel, career opportunities and incentive systems should be implemented.	Expenditures on research and development are still low. There is a lag compared to average expenditures of Western European countries and likewise the given proportion on 3% of GDP, given by the EU is not met. But referring to the last years, a positive trend, where expenditures on national and regional level (Košice region) have been increasing, can be seen. The main sources of finance include public funds; the proportion of private sector expenditures on research and development in the Košice region is lower.
	3. Leading figures and stakeholders	This factor describes the role of leading figures (entrepreneurs, Politicians and scientists) with regard to their influence on the shape of a RIS (Regional innovation system).	A regional innovation system encourages the rapid diffusion of knowledge, skills and best practice within a geographic area larger than a city, but smaller than a nation. The Košice Self-governing Region is in the process of preparing the Regional Innovation Strategy of Smart Specialisation by 2020.
S T R U C T U R A L C A P I T A	1. Technical infrastructure	For diverse R&D and innovation activities technological infrastructure (measuring and testing equipment, labs, IT...) must be disposable within reach.	TECHNICOM – In the future University Science Park will stimulate, develop and provide support mainly for applied research. It will implement effective knowledge transfers, products and technology transfers between universities, research institutions and companies in the marketplace based on mutually beneficial cooperation. It will also contribute to the development of innovation-based companies in the form of "spin-offs" or "start-ups". (2014)
	2. Scientific infrastructure	For diverse R&D and innovation activities scientific infrastructure (measuring and testing equipment, labs, IT...) must be disposable within reach.	MEDIPARK – Biomedical university science park as a high-quality centre for applied research and a centre for the implementation of results into practice in the field of biomedicine at both the national and international levels (realization in June 2015). There are also special laboratories available within university premises and departments of the Slovak

L		Academy of Science located in Košice, but there's not general information on available HW. The most important lab is Promatech – the research centre aimed at the new progressive materials.
	3. New technologies	<p>This factor stands for the implementation of new Technologies and technology transfer in companies. The acquisition of technologies can be done by own developments, purchasing technologies or patents, mergers and acquisitions or in course of cooperation.</p> <p>The aim of former Regional Innovation Centre: creation and diffusion of innovations, regional management of innovation. The special offices were established (at the UNIs – TUKE, UPJŠ); both offices are in the process of carrying out an internal audit, mapping of R&D and technology transfer possibilities with UNIs. The Technology transfer is basically realized via the Competitiveness and Economic Growth OP and Research and Development OP.</p> <p>The Košice Self-governing Region is a successful recipient of financial aid from the EU structural funds. During the 2007–2013 programming period, there have been 977 projects implemented, with a value of 968 million EUR in different fields within the region.</p>

Figure 2: Usage of financial resources in the Košice region according to the operational programmes in 2007 – 2013. ²



² Source: www.nsrr.sk

<p>4. IP Rights</p>	<p>The availability and protection of intellectual property rights is important in this context. This should be a factor under RC – Protection of IP rights.</p>	<p><i>Figure 3: Evolution of a number of registered patent registrations in Košice between 2005 and 2009</i></p> <table border="1" data-bbox="970 320 1430 443"> <thead> <tr> <th>2005</th> <th>2006</th> <th>2007</th> <th>2008</th> <th>2009</th> </tr> </thead> <tbody> <tr> <td>3,42</td> <td>2,33</td> <td>5,00</td> <td>3,00</td> <td>2,00</td> </tr> </tbody> </table> <p>TUKE: TT Office is also focused on protection of intellectual property (UCITT)</p>	2005	2006	2007	2008	2009	3,42	2,33	5,00	3,00	2,00
2005	2006	2007	2008	2009								
3,42	2,33	5,00	3,00	2,00								
<p>5. Innovation and R&D Budget within the company</p>	<p>For implementation of the innovation and R&D projects a corresponding budget must be provided. The necessary amount should correspond to the corporate strategic positioning (e.g., technology leader) and can be part of an innovation strategy.</p>	<p>Such a budget is allocated mainly by medium-sized and big industrial companies in the region.</p>										
<p>6. Geographic proximity of organisations</p>	<p>The geographic proximity of organisations and local to regional factors are of high importance in many industrial site models and are partly seen as key factors for the success of companies within these regions. (Clusters and centres of excellence are potential examples which could be mentioned within this context).</p>	<p>The Košice IT Valley cluster cooperates with SMEs, other clusters, international and foreign partners, public sector. Besides the KEITV cluster whose aim is to create suitable conditions for the creation and development of ICT centre, two other technological clusters operate in the Košice region. AT+R cluster focuses on the automotive technology and BITERAP aims at offering the ICT support for the processes in the public sector and control processes demanding higher level of security. In the neighbouring Prešov region the Energetický klaster (Energy cluster) promotes the use of the renewable sources of energy. The tourism clusters are represented by the city cluster of tourism – Košice Turizmus (Košice Tourism) and cluster Turizmus tatranského regiónu (Turism of the Tatra region) localized in the Prešov region.</p>										
<p>7. Internationalisation</p>	<p>Internationalisation leads to global competition, enhanced competitive pressure and at the same time to a decrease of the development time of new technologies through increased interdisciplinary cooperation.</p>	<p>There is international cooperation on the level of universities (TUKE, UPJŠ), region, city and the Košice IT Valley cluster.</p> <p>TUKE internationally cooperates with the countries of EU (mainly Czech Republic, Germany, France, Italy, Poland and Spain); it collaborates also with non-EU countries (e.g., USA, China, Russia). Within the LLP – Erasmus, the</p>										

		<p>university has cooperated with 124 partner universities from 21 different countries.</p> <p>UPJŠ has a contract with universities in Europe, America (USA, Mexico) and Australia.</p> <p>The region works closely with the V4 countries. Moreover, there is cross-border cooperation with Hungary (and Ukraine).</p> <p>Businesses in the field of ICT produce mainly for export. Local customers are not so common.</p>																		
<p><i>Figure 4: The biggest and the most important foreign companies and employers in the Košice region</i></p>																				
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #f4b084;"> <th data-bbox="512 707 887 813">Company</th> <th data-bbox="887 707 1174 813">Ownership</th> <th data-bbox="1174 707 1463 813">Number of employees</th> </tr> </thead> <tbody> <tr> <td data-bbox="512 813 887 896">U.S. Steel Košice</td> <td data-bbox="887 813 1174 896">USA</td> <td data-bbox="1174 813 1463 896">12 860</td> </tr> <tr> <td data-bbox="512 896 887 978">Yazaki Wiring Technologies</td> <td data-bbox="887 896 1174 978">Japan</td> <td data-bbox="1174 896 1463 978">3 400</td> </tr> <tr> <td data-bbox="512 978 887 1061">T-Systems Slovakia</td> <td data-bbox="887 978 1174 1061">Germany</td> <td data-bbox="1174 978 1463 1061">2 592</td> </tr> <tr> <td data-bbox="512 1061 887 1144">Embraco Slovakia</td> <td data-bbox="887 1061 1174 1144">Brazil</td> <td data-bbox="1174 1061 1463 1144">2 000</td> </tr> <tr> <td data-bbox="512 1144 887 1227">U-Shin Slovakia, s.r.o.</td> <td data-bbox="887 1144 1174 1227">Netherland, Germany</td> <td data-bbox="1174 1144 1463 1227">1 268</td> </tr> </tbody> </table>			Company	Ownership	Number of employees	U.S. Steel Košice	USA	12 860	Yazaki Wiring Technologies	Japan	3 400	T-Systems Slovakia	Germany	2 592	Embraco Slovakia	Brazil	2 000	U-Shin Slovakia, s.r.o.	Netherland, Germany	1 268
Company	Ownership	Number of employees																		
U.S. Steel Košice	USA	12 860																		
Yazaki Wiring Technologies	Japan	3 400																		
T-Systems Slovakia	Germany	2 592																		
Embraco Slovakia	Brazil	2 000																		
U-Shin Slovakia, s.r.o.	Netherland, Germany	1 268																		
<p>8. Trust, conventions and cultural aspects</p>	<p>This factor stands for non-formalised norms, rules, conventions, habits, traditions as well as trust, which arise from social interactions in the long run. These values are bilaterally accepted and reproduced by all actors.</p>	<p>In contrast to other OECD countries, cooperation between the business sector and research at the universities or Slovak Academy of Sciences is insufficient.</p> <p>Before 1918, only 20% of people living in Košice on average declared Slovak language to be their mother tongue. There was a mix of nations during the history of Košice – Hungarians, Slovaks, Polish, Jews, Germans and Romanies. On account of these various nations living in one place, Košice is today well-known as a city of tolerance.</p> <p>The significant impact on the mentality of Slovaks, their habits and culture, has a strong catholic religion and post-communist history. Slovakia had been for a long time confined from the surrounding world; the situation started to change after</p>																		

		<p>1989. Anyhow, “the old generation” is still conservative and afraid of new things.</p> <p>There is still a silent tension between east and west Slovakia, especially between Košice and the capital Bratislava, due to a different atmosphere, salaries, employment opportunities etc.</p>
<p>9. R&D Funding (programmes) – which are regionally available (could also be national ones, from which the region takes benefits) and fiscal incentives for R&D</p>	<p>This factor encompasses all kinds of direct R&D funding, such as diverse structural and thematic programmes on a regional, national and international (EU) level.</p>	<p>It is possible to obtain:</p> <ul style="list-style-type: none"> • Funding on the national level (VEGA, KEGA, APVV schemes) • EU Structural funds • EU / other international funds – ERDF, cross-border cooperation, Visegrad fund • EU community funds – FP7, H2020, LLP, Erasmus+ <p>Funds to support R&D on a regional level (Košice region) do not exist. There is also indirect support in the form of policies, strategies, and planned premises for the regional innovation centre, but not direct funding of R&D.</p> <p>There are examples of cooperation between university and business with even significant results (products to market), but no mapping or systematic approach has been implemented so far.</p>
<p>10. Institutions for knowledge transfer and support</p>	<p>Knowledge transfer institutions offer and coordinate supporting measures, consult and organise dissemination, networking and matchmaking, etc. Beyond this regional or national state organisations also support export (e.g. from the Košice region).</p>	<p>Chambers of commerce – Slovak chamber of commerce and industry, other chambers of commerce (American Chamber of Commerce)</p> <p>SARIO – has a regional office in Košice</p> <p>Clusters – IT Valley, Cluster AT+R</p> <p>Regional innovative centres – in Košice, Prešov – private activities</p> <p>Regional development agencies – Košice, Prešov (Košice and Prešov self-government regions)</p>
<p>11. Traffic facilities and local public infrastructure</p>	<p>This factor characterises the traffic and public infrastructure, especially public transport networks and super-regional transport connections.</p>	<p>Road transport: The region has roads of class I, II and III in the total length of 2379.3 km. In November 2013, the section of expressway R4 on the route Košice – Milhost was opened. The only highway section is motorway to Prešov.</p>

			<p>Air transport: The Košice international airport provides regular airline flights to Bratislava, Prague, Vienna and most recently London.</p> <p>Rail transport: Košice has a strategic position in relation to rail transport. Košice is located in the intersection of East West Corridor (Prague-Košice-Cierna nad Tisou) and north-south transit corridor (Košice-Poland-Hungary). Cierna na Tisou is a major railway hub for international transshipments.³</p>
	<p>12. Organisational structures for R&D and innovation (included as example in point 4)</p>	<p>For the generation of ideas and innovative products permanent organisational structures for innovation projects are of importance. These structures can be formed by temporary innovation management groups, teams for the creation and assessment of ideas to the point of permanent R&D departments.</p>	<p>UCITT (value chain): Promoting cooperation with practice (research, innovation, transfer of technologies) → Support for scientific, research and innovative projects → Support of intellectual property right protection → Support of human resources development and methodologies in the field of innovation and TT → Marketing support services UCITT</p>
<p>R E L A T I O N A L C A P I T A L</p>	<p>1. Cooperation with economic partners</p>	<p>This factor stands for cooperation between economic partners, which typically exists along the value chain (suppliers, customers).</p>	<p>UCITT (value chain):Promoting cooperation with practice (research, innovation, transfer of technologies) → Support for scientific, research and innovative projects → Support of intellectual property right protection → Support of human resources development and methodologies in the field of innovation and transfer of technologies → Marketing support services UCITT</p> <p>Example: IT Valley partners: ASIT, Centire, SARIO, ISA, BIC Bratislava, EEN, Bez&Dis, WUG Košice, ZMPS, Košice – Staré mesto, Košice regional chamber, Dunajský vedomostný klaster (Dunaj knowledge cluster), Dunajský vedomostný klaster, ITAS</p>
	<p>2. Cooperation with university partners (e.g. bigger projects, platforms, strategic alliances,</p>	<p>This factor describes different forms of cooperation with universities and other R&D institutions. It includes different forms of contracts, common projects and institutionalised forms of Cooperation.</p>	<p>Example: UCITT – VUKONZE, TECHNICOM (in process), INFRA PROJECTS (purchase of equipment for R&D)</p> <p>TUKE – possibilities of cooperation: European Technological Platform</p>

³ http://www.sario.sk/userfiles/file/sario/pzi/regiony/Košice/kosicky_kraj.pdf

competence centres.....)		ARTEMIS, CERN, industrial cooperation (contract based)
3. Cooperation with funding institutions from the private as well as public sector	This factor describes the financial support from different institutions, such as EIB and EIF or private VCs.	<p>With the hype of innovations, ideas of start-ups, spill-overs and spin-offs become more common in the region. Nowadays, many different activities are present:</p> <ul style="list-style-type: none"> • Independent – Start-ups Camp, Start-up weekend • University-based – TECHNICOM and MEDICAPARK project • Region-based – project of regional innovation park <p>Cooperation is still not highly present in the region. The above-mentioned activities are more focused on networking, promoting the topic, starting discussions and motivating.. There is no data available on VC.</p>
4. “Weak ties” – (suggested focus on the cooperation of the region with others)	This factor describes so called ‘weak tie’-relationships with others and also stands for an openness of the system to external actors.	n/a
5. Relations to national governmental institutions and policy makers	This factor describes the relation to several national policy makers and institutions, which govern the development of the regional entities.	The City of Košice is the seat of the Constitutional Court of the Slovak Republic. (The Constitutional Court decides on the compliance of the norms of the lower legal force with superior rule of law and the competence conflicts between central bodies of public administration). From the other state institutions, the President of the Slovak Republic runs a regional office in Košice, as well as the Government Plenipotentiary for the Roma communities. Other state institutions in the Košice region include subordinate offices of the ministries situated in Bratislava.

3. CHAPTER 3: ADAPTING IC METHOD TO THE KOŠICE REGION

3.1. INTRODUCTION

Eastern Slovakia has not reached the same level of maturity in innovation and industrial production as it can be seen in other developed regions in Europe (e.g., Bavaria in Germany). Historical reasons are apparent why this is the case, but thanks to the re-unification of Europe, borders no more constitute obstacles for free movement of products and services. However, the

cooperation between stakeholders must be nurtured and emphasized in the Košice region in order to catch up with good practice as it exists in many European countries. These close ties are crucial for developing sustainable economic growth in any region. The Košice region has the pre-requisites to catch up but it has to start working on developing a road map in this area. This should be based on the existing competencies; relations between them must be clearly defined; and recommendations should be supplied in order fill in the gap where competencies are lacking. This is the task of the LEGEND project that uses good practices from outside the region to show the direction.

When developing the road map, it must be understood that there are different tasks for and expectations from various actors engaged in the value chain creation – as it is described in the Part 1 of the IC report. The SMEs should focus on how to structure the existing human capital into a customer value while including suppliers and universities in their search for competencies as well. On the other side, a state or regional system is decisive. No SME alone can start exporting without guidance and professional support from the outside. (For instance, if the tax system punishes labor and favors capital gains, no entrepreneurial spirit will emerge!) This is the task of regional development organizations to provide those pre-requisites. In the section 2.2, the key factors are defined which a region should take into account when trying to create positive surrounding for SMEs to be nourished and supported. The given factors should be, therefore, considered from a perspective of SMEs in any market if they are to exist and to grow there.

The following section contains a set of examples from Austria and Germany and recommendations for implementation of IC method in SMEs, HEIs and other regional partners. This information will constitute a basis for developing education materials tailored to the needs of each of the target groups.

3.2. PERSPECTIVE OF SMALL AND MEDIUM-SIZED ENTERPRISES

Author: Mart Kivikas, Wissenskapital

INTERNATIONAL PERSPECTIVE – THE GERMAN EXPERIENCE

ProLeit AG, Herzogenaurach, Germany

Based on an interview with Mr. Wolfgang Ebster, CEO ProLeit AG on 13 May 2014 in Herzogenaurach

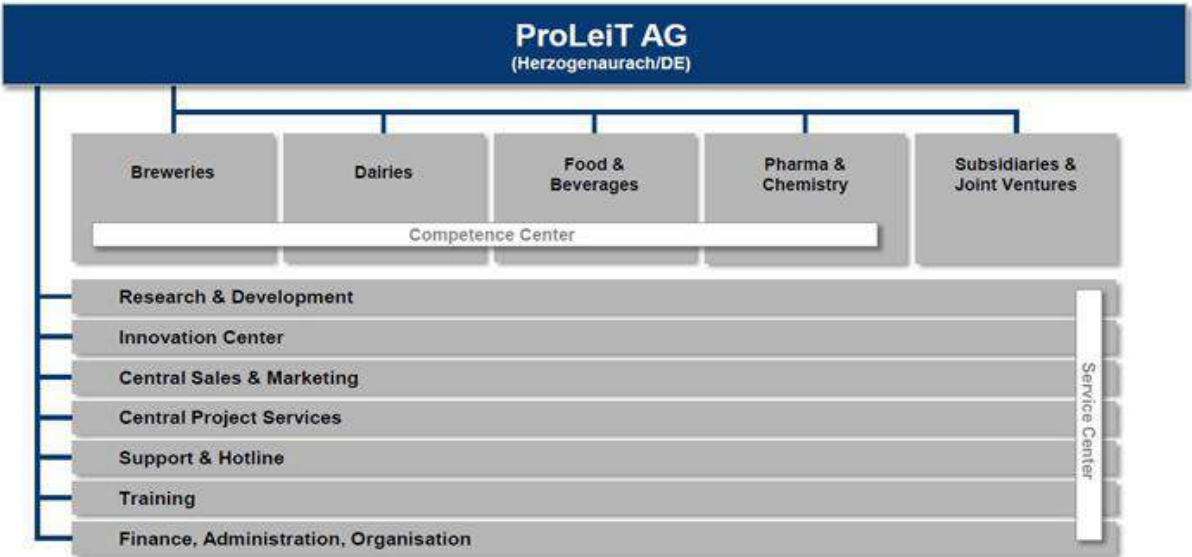
Since its foundation in 1986, “ProLeiT Gesellschaft für technologieorientierte Prozessleit- und Steuerungssoftware mbH” has been developing tailor-made industry solutions for its customers in the food & beverages industry as well as the pharmaceutical & chemical industry. This applies to the realisation of turnkey automation projects and the in-house developed process control system range Plant iT and brewmaxx.

ProLeiT AG, headquartered in Herzogenaurach, Germany, offers process control technology, automation solutions and process control systems with integrated MES functions for all process engineering industries worldwide. The main customers come from the brewery, beverage and dairy industries, as well as the food sector and chemical and pharmaceutical industries. The

corporate structure is tailored to the requirements of these diverse sectors. Electrical engineers, computer scientists, process engineers, brewers and food technologists work together in specific areas of the company. This combination of technical know-how and practical engineering enables the development of ideal solutions for the respective industry.

The ProLeit Group stands for local presence and international market expansion. They are present where their customers are. Besides its global partner network, they have international subsidiaries in the USA, Mexico, Brazil, the Netherlands, Spain, Austria, Russia, the Ukraine and China. The ProLeit Group employs roughly 275 people worldwide.

Figure 5: ProLeit AG



Source: ProLeit AG

After almost 30 years in business, CEO Wolfgang Ebster shared his view on how to succeed in building an innovating and successful international business. According to his experience, **it is important to find loyal, motivated and well educated people**. The region of Erlangen and Herzogenaurach has a long tradition of educating engineers and Siemens AG has around 70.000 employees in the metropolis region of Nürnberg-Erlangen. The employees can participate via stock options and the results are communicated openly to all. Very low personnel fluctuation is the result of such an approach. Before expanding into new markets, the managers must work at the HQ for at least six months. As acting locally, you have to take care of your reputation in order to get competent personnel. Flexibility and individual education in working conditions are competitive advantages towards the big players and is a top management theme.

There is a knowledge network within project groups with one “knowledge manager” responsible to coordinate and communicate with the stakeholders before a project starts. Special focus is on risk based on experience from other projects. **Funding is crucial** and the State of Bavaria has been a great support. An entrepreneur should be careful with universal banks because they may change their strategy within months. It may be difficult to get long-term

commitments from these banks, so trust can be easily established with local and state-owned banks. It is important to **protect the outcome of their work**. Information is crucial and should be kept inside the company as much as possible. Only through customer innovation there is a chance to stay competitive and be one step ahead of competitors.

LOCAL PERSPECTIVE – SMALL AND MEDIUM-SIZED ENTERPRISES FROM EASTERN SLOVAKIA
Based on the meeting with representatives of SMEs in Eastern Slovakia on 25-27 March 2014

The basic framework of Intellectual Capital Statement was used also with regard to the regional development project KnowCities in 2013.^[1] These factors take into consideration and account the reality of a small and medium company. It allows looking at opportunities how to grow a SME in a profitable way without damaging its image or reputation. Over time, those eleven factors have showed to be relevant for the Earnings Capability in any environment and it is important to have a look at all of them and at how they influence one another. Definitions of IC factors and business goals were adapted to the Košice region on the basis of the feedback from local small and medium-sized companies during meetings of the project team members with SME representatives in Eastern Slovakia in March 2014.

Business Goals

Growth	Focus on organic growth; it can be achieved in two ways: 1. overall market growth 2. technical, innovation or organizational source of growth
Cash-flow	The time horizon is important, investments decline cash flow; within a certain market situation
Image	What do people outside the company think about us? Different aspects are: - overall strategy - brand - marketing activity plans - sales strategy There may be different layers: 1. for partners and academics 2. for customers 3. for potential employees

Human Capital

Professional skills	This is what you learn from school and education, courses, professional education. This is what you can improve by learning. This is also professional experience and knowledge how the company works and goes. Learning by doing
Social competences	This is how you interact in your environment. It covers communications skills, your attitude to learn new things, to listen to others, to adopt to changes, to teamwork

[1] <http://www.test.knowcities.eu> and “A model for understanding and assessing Knowledge Cities“, Willem van Winden and Luis de Carvalho, Urban IQ, June 2013

Motivation	There are two drivers for that: external (working environment, internal processes) and intrinsic (passion, reaching own personal goals)
Leadership & management skills	The way the manager influences his/her employees; the charisma, allowing mistakes and learning; setting criteria for promotion

Structural Capital

Internal processes	All internal guidelines and instructions; IT tools; standard for knowledge sharing; idea management
Internal communication	How do people actually perceive the way we communicate with one another, share information; do we have clear and realistic goals
Company culture	Code of conduct; values and norms; attitudes that are promoted and not accepted
Organisational and management structures	Reporting standards, personal development and promotion standards; transparency; complexity of the structure; how adjustable is it for changes; responsibilities and delegating, empowerment

Relational Capital

Customers relations	Do we have the right ones, do we have enough, customer mixture, do you involve your customers in improving your business, innovation process, new product development
Partners relations	Access to external know-how and expertise; future employees
Suppliers	Do we integrate them in our product and business development; do we have enough suppliers; do they deliver right things at the right time (not only office equipment)

3.3. PERSPECTIVE OF HIGHER EDUCATION INSTITUTIONS

Authors: Roswitha Wiedenhofer & Christian Friedl, FH JOANNEUM, University of Applied Sciences, Graz

INTERNATIONAL PERSPECTIVE – THE AUSTRIAN EXPERIENCE

Experience with ICR and policy recommendations from the Austrian Federal Ministry of Science, Research and Economy

Based on the interview conducted by Dr. Roswitha Wiedenhofer with Mag. Reisner, 21 March 2014, Vienna (for the transcript in German see Annex 2)

The following paragraphs provide a comprehensive summary of recommendations from the Austrian Federal Ministry of Science, Research and Economy with implementation of ICR by Austrian higher education institutions:

- 1. A HEI ICR methodology can include more than a standard ICR**
The ICR methodology for Austrian universities goes beyond the standard IC reporting as it includes narrative parts in the sense of an annual report and the evaluation of the performance agreement indicators (in the sense of the level of fulfilment). It is applied for gathering statistically data (approx. 60% - currently decreasing) and as a steering instrument/dashboard (approx. 40% - currently increasing). The usage of ICR as a steering tool shall be further extended and the level of application for university management differs between Austrian universities. The University of Innsbruck strongly applies ICR as an internal steering tool since the first implementation and produces a very condensed and effective ICR. Besides, the ICR are a main source for elaborating the reports to the National Council, especially the narrative parts concerning Public Management and Teaching.
- 2. A major challenge is the heterogeneity of the universities.** There are big differences between the university structures and scientific disciplines that need to be considered to a certain degree. To allow an overall comparability between all universities, there needs to be a minimum consensus. Therefore, the Austrian methodology allows only one set of indicators for all universities (top-down; the disciplines are based on the Frascati System). The benchmarking between universities is done within scientific similar universities (e.g. technical, medical, arts), but there are also difference within those categories. In addition, the universities can propose optional indicators (bottom-up). The bottom-up approach can create valuable input for further development and improvement of the set of indicators and shall be extended.
- 3. The selection and amount of indicators are crucial.** There are “hard” and “soft” indicators. The “hard” indicators are key figures from teaching (number of students taking exams, graduating etc.), R&D (number of R&D projects, revenue etc.) or the number of publications (in ranked journals for instance). Those indicators are relevant for the distribution of financial means to the universities. The new Austrian university financing system shall include one relevant indicator to distribute the means. This indicator shall be integrated in the ICR system. The “soft” indicators have no direct influence on the distribution of financial means, but create input for the Ministry-Universities dialogue to identify potential challenges. Before implementing the Austrian system, more than 100 indicators have been discussed. The first implementation included 56 indicators. It took some time to develop the experience to draw relevant assumptions from the collected data to apply the indicators as a proper steering instrument – a major rationale for justifying the efforts of producing the ICR for all parties involved. A review/revision was necessary in 2009, where the number of indicators has been further reduced to 42 and the overall reporting structure was updated, e.g., the performance report got integrated in the narrative part of the ICR.
- 4. The ICR methodology is a dynamic & open process and continuously improving.** As the HEI system is constantly changing (e.g. growth and modernization of eLearning methodologies like MOOCs), the ICR model needs to depict developments too. The Austrian ICR methodology currently follows a re-active approach, as it is also dependent from and influenced by policy-decisions. This could cause some delay in adapting indicators to new developments. There is a steering group/working group by the Federal Ministry in place to improve the usability and accountability of the ICR methodology. In addition, the

universities just started a working group to improve the integrability/comparability of the indicators to international measurement tools like U-MAP or Multirank.

5. **The success of the ICR implementation and application as a steering instrument strongly relies on the acceptance by the universities and their level of commitment & involvement.** The implementation in Austria was introduced as a compulsory measure and therefore it was difficult to get the acceptance by the universities (although this was improving over time). It was and still is key to integrate all parties in the development process and to point out and include potential benefits for the universities. It is essential to create synergies and not to create double burdens when collecting data for indicators that are not directly relevant for the universities themselves. Most universities are using the ICR only to rigidly follow the legal requirements. Some universities also apply it as a tool for strengthening their image (e.g. TU Graz additionally integrates an “entrepreneurship-radar” in the ICR).

Recommendations for the ICR implementation for HEIs in other countries

Based on the set of recommendations from Mag. Reisner

1. **Less is more.** It is better to reduce the number of indicators to the minimum indicators needed. 56 indicators, like in Austria, have been too much. It is essential to be aware of the overall objective of the indicator and also to define the way of achieving it.
2. **Dialogue is crucial.** The top-down approach was necessary in Austria, because of the legal requirement to implement ICR, but the development process of the ICR methodology is improving with the level of commitment of the universities.
3. **Data-clearing is a major challenge.** In the Austrian system, the majority of data to the indicators are collected by the universities (decentralized) and the clearing is conducted via a centralized tool. A comprehensive compendium supports the actors and shall reduce misinterpretation of indicators. A plausibility check shall reduce potential errors in the data collection. The universities provide explanation if a certain indicator has significantly changed. This also allows for further discussion between Ministry and universities on potential areas of improvement.
4. **Development is important** (with respect to the dynamic nature and continuous improving process of the ICR methodology), **but shall not restrain consistency.** If the set of indicators change on an annual basis, the comparability over time is infringed. Development is crucial, but it needs to be carefully considered to adapt valid data. New factors and indicators also need to be reasonably justified, to get acceptance by all actors.

Experience of and policy recommendations from the University of Graz

Based on the interview conducted by Dr. Roswitha Wiedenhofer & Mag. Christian Friedl with Mag. Andreas Raggautz & Mag. Marion Bernhard, 29 November 2013, Graz

The scientific disciplines applied by the Austrian HEI ICR model (Frascati) do not fit to the organizational and scientific structure of the University of Graz which causes double-efforts and low synergies. Therefore, the ICR is not applicable as a steering tool so far.

Some indicators cause misinterpretation and comparability is not possible without providing and understanding certain background knowledge. From the perspective of the University of Graz, the effort exceeds the benefits gained from ICR reporting in the current stage. There is “internal translation” necessary to collect the right data within the own organization and “external translation” necessary to back-up the data submitted to the Ministry with background explanations to avoid misinterpretation. Some indicators are insufficiently defined and a sound calculation/evaluation is not possible with this “one-fits-all” approach. Some indicators are not justified or useful from the University of Graz’s perspective and other crucial indicators are missing in the ICR methodology. In addition, the compatibility with other tools and reports required by law could be improved – many key figures are not related. Some improvements have been realized with the revision of the ICR methodology in 2010 and with the opportunity to integrate optional indicators.

The **main recommendation** of the University of Graz would be to completely reset and re-define the current ICR methodology by clearing invaluable indicators and adding new ones with strong involvement of the HEIs to allow high accountability of ICR as an integral tool and not as add-on to existing steering tools.

Experience of and policy recommendations from the Technical University of Graz (TU Graz)

Based on the interview conducted by Dr. Roswitha Wiedenhofer & Mag. Christian Friedl with Dr. Renate Euler & Mag. Manuela Berner, 8 January 2014, Graz

The Technical University of Graz has comparable experience with the University of Graz, but it has extensively tried to reduce double-efforts by using existing reporting channels.⁴ Nevertheless, the majority of automatically collected data for ICR has to be additionally adapted to meet the requirements of the Austrian HEI ICR model.

As the indicators leave room for interpretation (although there is a comprehensive compendium that explains each criteria), every HEI does its own interpretation which diffuses comparability. For instance, TU Vienna includes their deans when accounting university management staff and reports 20 people, TU Graz only accounts rector and vice-rector adding up to 2 persons. At TU Graz, ICR is partly applied as steering instrument, but rather re-active than pro-active. It is used to underline strategic goals if applicable, but not to outline and target a certain strategic goal in advance.

The **main recommendation** of TU Graz is (in line with the University of Graz) to remove indicators that generate no benefit for the HEIs and add additional indicators that are useful for the own university management. Additionally, the performance report shall be excluded again and published separately, because TU Graz applied it for external marketing measures. The final recommendation of TU Graz is that if indicators are developed and implemented, they shall be in line with all the other indicators that are required by other reports to the Ministry and public bodies.

⁴ Annotation by the author: A reason could be that the strict scientific classification system of the ICR methodology causes more inconsistencies within a University offering a broad variety of scientific disciplines like the University of Graz in comparison to more specialized universities like Technical or Arts Universities.

Experience of and policy recommendations from FH Joanneum Graz

Experiences have proved that the following essential prerequisites have to be in place to implement a sound ICR:

- Strategic framework for an assessment must be defined
- Processes must be clearly defined
- Intellectual capital report model must be developed/defined
- Indicators can be defined
- Data sources and data availability for indicators must be given

Recommendations

FH JOANNEUM took advantages of having the “freedom” to pick own indicators from the one-fits-all model of the Austrian HEI ICR methodology and made good experiences from creating a tailor-made solution without a top-down approach. Therefore, we recommend the Slovakian colleagues to build on the Austrian experiences and develop their own model and **avoid a top-down implementation**.

Regarding the data collection, it is essential to focus on a minimum amount of indicators that are really necessary to keep additional effort as low as possible. One crucial step in the development of the data collection tool is to enable the recording of the necessary data in real-time during the course of the year. Support for continual data entry will not only enable valuable databases to be generated for each individual employee, but also provide their superiors with an up-to-date overview of relevant benchmarks and allow them to respond immediately when the need arises. Otherwise, it is necessary to wait until after the data has been gathered and made available in consolidated form before taking any action. The experience with ICR at FHJ has also shown that the **selection of indicators should be made by keeping in focus the strategic relevance of single indicators**. They should reflect the profile to the institution in a holistic manner and not necessarily depict all organizational knowledge.

Beyond that **it is important to keep the number of indicators small and their definition simple**. It is not necessary to measure everything, but only those indicators which are valid, clearly defined, and measurable and can guarantee continuity in data collection (Pöllinger, 2010). The definition of indicators is a tricky task, since in some cases it is e.g. hard to define the system boundaries between “internal” and “external” focus and assign indicators correctly (e.g. continuing education of employees – such an education will only be documented within the FH ICR, if the FH comes up for costs or other in kind contribution in course of this education). Thus also at a first glance “simple indicators” are sometimes hard to define (Interview Pöllinger, Wiedenhofer, 13/5/2014).

At the beginning of ICR-implementation at FH JOANNEUM a huge number of indicators were introduced (205). It was a difficult process to cut down this number to the actual valid number of 55 main indicators and 85 further indicators. Therefore, **we recommend that the data gathering and analysis process is simplified** and to raise the acceptance of the Intellectual Capital Report at all levels within the institution by giving the employees the opportunity to

access valuable data at any time. This will make it easier to control strategic processes and provide more in-depth information as a basis for decision-making.

Actually the annual ICR publication is noticed as a relevant means of internal and external (stakeholder) communication and this function is still judged as the most relevant benefit of the whole IC engagement. Although there is a defined process in course of which the University Management defines the knowledge goals (in sense of trends up and downwards) for the respective next business year, the use of ICR as a steering instrument has still quite a potential for further improvement.

LOCAL PERSPECTIVE – RECOMMENDATIONS FOR HIGHER EDUCATION INSTITUTIONS IN SLOVAKIA

At the stage of producing this report, a set of recommended factors has been identified by the HEI consortium members FH JOANNEUM (see list of selected factors for HEIs in the following section) that needs to be discussed with local HEI experts from the Košice region. **A meeting with HEI and ministry representatives is planned in work package 4 of the LEGEND project and this section will be updated according to the feedback solicited from the local experts.**

Recommendations to HEIs based on the Austrian law on ICR

Based on the collected feedback by key actors building on 9 years of experience with HEI ICR reporting in Austria and the literature review of current research papers on ICR reporting (esp. Leitner et al., 2013), we draw recommendations that are presented in the subsequent section.

It is highly recommended to avoid a single top-down and “one-fits-all” approach. There needs to be a certain amount of common indicators to be able to draw comparisons between HEIs, but this often leads to difficulties such as misinterpretation, non-availability of data, high efforts to collect the data and a lower acceptance level by the actors. As it is a trade-off between comparability and applicability, we recommend to define a set of minimum requirements and indicators that all HEI have to deliver (for reasons of comparability) and provide room for defining own indicators by each university and for specific research disciplines to trigger the application of ICR as a steering tool for university management.

It is recommended to select a mix of indicators for the ICR methodology out of following:

1. Common national indicators: For reasons of comparability, a certain amount of indicators needs to be introduced that are applicable to all HEIs within the country.
2. Discipline specific indicators: A set of indicators should be devoted to meet the requirements of specific scientific disciplines.
3. HEI specific indicators: As each HEI defines its own strategy, follows its own approach to obtain the objectives and inherits different characteristics, strengths and opportunities, it is important to include respective indicators and allow the HEIs to tailor at least parts of the ICR methodology to their own needs. This also significantly raises the acceptance

and commitment level of HEI actors and supports the application of the ICR methodology for university management steering procedures.

It is contra-productive that the ICR methodology is designed by external actors. **It is crucial that the set of factors/indicators is jointly developed by the local actors (Ministry & universities) themselves** building on existing experience and tailored to the local context to achieve the commitment, effectiveness and appropriateness needed. The Austrian implementation methodology (the ICR implementation was stipulated by law) did not allow an open development process and it took years to repair, adapt and improve the initial top-down approach.

As FH JOANNEUM is not a public university and was not obligated by law to apply the pre-defined indicator set of the Austrian HEI ICR methodology, FH JOANNEUM was free to pick appropriate indicators and develop its own most suitable ICR approach building on the national HEI ICR model. Therefore, we recommended steps and present sets of potential useful indicators that have been identified over the years as an input for the Slovakian actors (Ministry and HEIs) to create their tailor-made Slovakian ICR methodology.

Recommended steps for developing ICR at Slovak HEIs

1. **Checking the framework conditions** (such as Legal framework, Strategy & Knowledge goals): The legal environment, strategies and knowledge goals of a HEI are the framework conditions essential in creating and developing intellectual capital.
2. **Definition of Intellectual capital**: The intellectual capital could be divided into three areas: human capital, structural capital and relational capital. Human capital shall describe the skills and competences of HEI staff, as well as their motivation and learning ability. Structural capital shall assess the environment that employees need to work productively. It includes structures, processes and procedures documented at the HEI. Relational capital shows the extent to which the HEI is interlinked with external partners and perceived by interested parties. The term “networking” refers to cooperation with other institutions such as research establishments or business enterprises.
3. **Definition of the Knowledge Goals for the core processes** of the university (such as “Teaching”, “R&D” and “Continuing Education”) for Human Capital, Structural Capital & Relational Capital: The core processes could be divided into the areas of teaching, research & development and continuing education. For instance, for a University of Applied Sciences like FH JOANNEUM, teaching shall refer to postsecondary education and focus on the degree programmes provided. The area research & development includes the implementation of research projects and innovative services. The core process continuing education deals with symposia, seminars, lectures, continuing education events and the postgraduate courses of the HEI.
4. **Clarification of output and impact on the relevant stakeholders** of the HEI (such as students, graduates, potential owners, representatives, funding partners, staff, the public, scientific community & industry): The benefit of all these core processes is finally

reflected in the output and impact. The success of the processes is measured by their impact on the relevant stakeholders.

Proposal of indicators for HEIs in Slovakia

Human Capital

Human capital describes the skills and expertise of HEI staff, as well as their motivation and learning ability.

Possible indicators	Detailed information / examples
Number of HEI employees	Full-time equivalent
Number of HEI employees	Head count
Gender breakdown of staff	Male/female, gender balance
Average age of staff	
Total number of affiliated lecturers	Head count; e.g. total of all degree programmes and courses. Affiliated lecturers teaching in several degree programmes could be counted only once.
Gender breakdown of affiliated lecturers	Male/female
Total number of administrative staff	Head count
Number of professorships awarded	
Development of HEI staff figures over time	Staff figures – head count
Occupational structure of HEI employees	Heads of degree programmes, faculty members, professional lecturers, research assistants, administrative staff, others...
Qualification structure of affiliated lecturers	Postdoctoral lecturing qualification, doctoral degree, diploma or master's degree, other qualification
Qualification structure of heads of degree programmes, faculty members, professional lecturers and research assistants	Postdoctoral lecturing qualification, doctoral degree, diploma or master's degree, other qualification
Highlights for Human Capital	Such as new staff, new memberships in (inter)national boards, committees, equality and diversity improvements.

Structural Capital

Structural capital assesses the environment that employees and students need to work productively. It includes structures, processes and procedures documented at the HEI.

Possible indicators	Detailed information / examples
Expenditure on literature and media	In EUR; investment "Library".
Investment in information technology	In EUR; investment "IT".
Students per computer	A figure based on all PCs in seminar rooms, lecture halls and

	laboratories.
Floor space per student	Net m ² per student based on the entire floor space available for educational purposes at the campus, exclusive of floor space occupied by administrative departments, hallways etc., but including libraries.
Investment in laboratory equipment	in local currency; investment “Technical Equipment and Machinery”.
Certifications / Accreditations	Number of institutional certificates and accreditations; personal certificates awarded to employees for the completion of continuing education courses not included.
Expenditure on literature and media types	Scientific literature, online resources, newspapers and journals...
Highlights for Structural Capital	Such as founding of new laboratories, special awards etc.

Relational Capital

Relational capital shows the extent to which the HEI is interlinked with external partners and perceived by interested parties. The term refers to cooperation with other institutions such as research institutions or business enterprises as well as the mobility of lecturers and students within the network of partner universities.

Possible indicators	Detailed information / examples
Total number of existing cooperation contracts	Cooperation based on a legal relationship.
Number of press releases	Total number of press releases issued by the PR department, may not include press invitations to various HEI events and press releases issued by the individual degree programmes within the scope of projects. Adjusted value – press releases that can be assigned to several degree programmes could be counted only once etc.
Number of page views on HEI website	Sum of all general web pages including/excluding pages of degree programmes.
Number of PR brochures	
Number of loans from the library	
Hours taught at other universities	A total of all teaching assignments (course units) of HEI employees at other national and international universities.
Number of cooperation contracts by region	
Number of cooperation contracts by type of institution	
Number of partner universities	
Number of outgoing lecturers	
Number of incoming lecturers	
Number of outgoing	Such as exchange promotion programmes encouraging

employees under Staff Mobility Programmes	administrative employees to gather experience in their area of work at foreign partner universities.
Number of outgoing students	
Number of incoming students	
Highlights for Relational Capital	Such as joint degree programmes, global exchange programmes, communication across borders programmes, conferences, student mobility records, special cooperation and collaboration projects with industry, public bodies or other HEIs etc.

Core processes

At HEIs, several processes are considered core for achieving educational objectives, namely teaching, research & development and continuing education. The following section provides an overview of possible indicators for these processes.

TEACHING

Possible indicators	Detailed information / examples
Number of degree programmes	For instance degree programmes active or approved in the reporting period; breakdown in Bachelor degree programmes, Master degree programmes, Diploma degree programmes, ...
First-year places including breakdown	Bachelor degree programmes, Master degree programmes, Diploma degree programmes, ...
Number of first-year places by degree programme over time	
Development of student numbers over time	
Number of prospective students	Sum of prospective students of individual degree programmes and of the HEI in general. Prospective students interested in several degree programmes shall be counted only once etc.
Number of students including breakdown	Bachelor degree programmes, Master degree programmes, Diploma degree programmes, ...
Admission statistics	Total of applicants
Number of drop-outs	
Number of drop-outs in relation to number of students	%
Number of graduates including breakdown	Bachelor degree programmes, Master degree programmes, Diploma degree programmes, ...
Development of graduate numbers over time	
Number of lecturers	Head count such as consolidated value of faculty members, professional lecturers and affiliated lecturers.
Sum of total hours taught per week	Number of total hours per week taught by faculty members, professional and affiliated lecturers. Make decision, if a course of 2 hours per week taught in 2 groups shall be counted as 4 total hours per week.
Number of visiting lecturers	There can be a definition/threshold set up, at which level a

	lecture counts as guest lecture. For instance, up to a certain amount of course units.
Staff / student contact	Number of hours per week taught per student,
Structure of teaching staff	Number of faculty members, professional lecturers / affiliated lecturers...
Total hours per week taught by faculty members, professional lecturers / affiliated lecturers	
Total number of work placements	Number of national and international work placements including placements under the LLP / Erasmus programmes. There could be a threshold for not counting short-term work placements or placement carried out on a continuous basis.
Number of diploma / bachelor's / Master's theses	
Highlights for the core process teaching	Such as successful careers, new programmes, new joint programmes, anniversaries of study programmes, extension of the programme offer, Gender Mainstreaming initiatives, eLearning initiatives etc.

RESEARCH AND DEVELOPMENT

Possible indicators	Detailed information / examples
R&D projects including innovative services	
Number of scientists financed by third-party funded R&D projects	Full-time equivalent.
Number of R&D projects	Number of ongoing projects within the reporting period.
Income from R&D projects	Revenue from R&D activities allocable to the financial year, including change in inventory.
Income from R&D projects	%; e.g. division of national & international.
Number of publications	Sum of all publications by degree programmes, courses, research units and central departments.
Structure of publications	Journal articles, books, edited or contributions to edited volumes, contributions to conference proceedings.
Awards for research achievements and innovative projects	
Number of employees enrolled in doctoral programmes	
Revenue from R&D projects by clients	
Highlights for the core process R&D	Such as prestigious or awarded projects.

CONTINUING EDUCATION

Possible indicators	Detailed information / examples
Continuing education hours	Average of total hours of continuing education completed,

per employee	for instance at continuing education events attended, by employees of all degree programmes, courses, research units and central departments. Number of employees could be based on full-time equivalent.
Continuing education costs per employee	Continuing education costs corresponding to material costs – including travel and accommodation –e.g. per cost centre, divided by the number of employees (full-time equivalent) per cost centre related to full-time equivalent etc.
Continuing education events organized by institution	Number of seminars, courses, lecture series, conferences and symposia, organized and carried out by degree programmes, courses, research units and central departments of the own institution.
Continuing education events carried out by institution's staff	Number of extracurricular lectures, seminars, courses and teaching assignments carried out by own institution's employees at other universities, institutions and organizations.
Number of postgraduate courses	
First-year places	
Number of total hours taught per week	
Number of students / participants	
Number of graduates of postgraduate courses	
Highlights for the core process continuing education	Such as summer schools, special events such as conferences, eLearning and online courses, open public lectures, anniversaries of programmes, special continuing education offers for teaching staff such as a didactics training programme etc.

References

Leitner, K. H./Elena-Perez, S./Fazlagic, J./ Kalemis, K./Martinaitis, Z./Secundo, G./Sicilia, M.-A./Zaksa, K. (2013): A Strategic Approach for Intellectual Capital Management in European Universities: Guidelines for Implementation, Research Paper, 2013

Pöllinger, M.: Wissensbilanzen für Fachhochschulen, Sinn oder Unsinn? In: Brünner, Ch., Hauser, W. et al., „Mensch-Gruppe-Gesellschaft“, Festschrift für Manfred Prisching zum 60. Geburtstag, Neuer Wissenschaftlicher Verlag, S. 811 ff., Graz, 2010

3.4. PERSPECTIVE OF OTHER REGIONAL PARTNERS

INTERNATIONAL PERSPECTIVE – THE GERMAN EXPERIENCE

Author: Mart Kivikas, Wissenskapital

Cluster – Medical Valley

Based on the information from an interview with Head of Cluster Marketing & Development, Member of the Managing Board, Jörg Trinkwalter

With an area of around 19,000 square kilometers, the European Metropolitan Region Nuremberg covers the administrative region of Central Franconia, almost the whole of Upper Franconia, two local authority districts in Lower Franconia as well as about half of the Upper Palatinate. A total of 3.5 million people live in the metropolitan region.

Healthcare and medical engineering have a tradition as the region's core technological competencies. Promoting these competencies is anchored in the strategic goals of the European Metropolitan Region Nuremberg. These goals are:

- To promote the region under the brand „Metropolitan Region Nuremberg“;
- To consolidate the functions and organization of the „Medical Valley“ team;
- To have an impact in the European Economy;
- To support cooperation within the region, especially between SMEs.

The aim pursued by the Medical Valley EMN Association e. V. is to give a permanent boost to the region, secure jobs and maintain competitiveness in the international market. That is why the Association has taken on the responsibility of providing advantageous working and research conditions for its members and partners. The established, close-knit partnerships with politicians and health insurance companies, which have been nurtured in the Medical Valley EMN, have supported the Association in this endeavor.

In a dialogue taking place two times at the beginning of 2014, Mr. Trinkwalter, the cluster manager, took a look at the IC factors for the Košice region presented above in the section 2.3. He is familiar with the IC Statement since their cluster had already undergone a similar process through a series of workshops with Wissenskapital since 2006.

Having very clear and realistic strategic goals is most important. In addition, it is necessary to indicate a time limit for reaching them as well as to propose a number of indicators to measure them. Very often a lot of enthusiasm exists at the beginning. However, after a while only little has been achieved and one has a feeling that he/she tries to do everything at the same time while, in fact, he/she lacks the focus of what is really necessary. Mr. Trinkwalter emphasizes the importance of having employees who think „out-of-the-box“, have more of general skills and experiences and are not afraid to ask critical questions. The real challenge is to combine various competences in order to create more overall value.

The role of funding constitutes another issue. One cannot push innovation and company growth without solid funding – this can range from starting incubators or offering free office space to providing venture capital. It is beneficial to have all those elements combined in the whole, which is what the Medical Valley tries to achieve. The experience so far shows, however, that too much focus has been given on supporting start-ups while, at the same time, disregarding the already up and running businesses. Therefore, from our perspective it is important to support the existing SMEs in order to help them grow and expand within Europe as well as to other markets, such as China or the US.

Politician – mayor

Input IC based on interviews with the Head of the District Authority Erlangen-Höchstadt, Bavaria, Alexander Tritthart

Alexander Tritthart – as the Head of the District Authority since Mai 2014 in Erlangen-Höchstadt, Bavaria and the former mayor of Weisendorf – has a long experience in economical and financial management at the regional and municipal levels. According to him, creating favorable environment for business is an important precondition for regional development. His region is an example of being able to use some of the corporate taxes locally. He points out that many restrictions exist from the side of the Federal State and the European Commission when it comes to direct intervention in the economy. For instance, his region cannot subsidize building of high speed internet for citizens because this would intervene in a competitive telecommunication market which is in private hands. Although funds have been available, speeding up this process is beyond his sphere of influence.

Additional pressing needs of today include infrastructure and finding skilled labor for many vacancies, especially in the service sector. In the area of innovation, incubators and subsidized regional centers have been active in supporting start-ups and small enterprises. The outcome so far is satisfactory but he is looking for a model on how to fund smaller companies to grow and overcome the so-called “death valley”. Therefore creating more well paid jobs in the region is a priority.

Regarding skilled labor, a round table is planned with representatives of “Mittelstand”, professional schools and the chamber of commerce to improve communication and to adapt curriculum to SME needs. This has been working excellent so far. However, due to the demographic situation, less young people are available. As a result companies must work harder to attract new employees. The practice of bringing skilled labor from neighboring countries has had mixed result. An emphasis, thus, needs to be put on attracting skilled labor from people already living in the region – such as home wives and elderly persons – who are interested to extend their working life by extra years.

Despite the fact that many support initiatives of bringing the existing labor to the market or working more hours can be found in the region, the legislation makes it very difficult to have more flexible agreements in the labor market. The pressure from trade unions and political lobby in Berlin is strong. But these issues at least have been on the agenda; and concepts have been proposed how to address them. Mr. Tritthard perceives his seven-year long mandate by being elected to this position as an advantage. It allows him to focus on long-term issues. Moreover, the tangible benefits resulting from attracting investments in the area could also be seen as good political capital and regional governance in the future.

LOCAL PERSPECTIVE – OTHER PARTNERS FROM THE KOŠICE REGION

Cluster and Large Companies

Author: Miriam Brašková, Košice IT Valley

Košice IT Valley, as the project partner and a representative of the project target group, perceives the set list of indicators as appropriate for the analysis and implementation of the IC

methodology in the Košice region. The provided factors are sufficient to provide an overview of the state-of-the-art of IC capital in the Košice region and Eastern Slovakia. However, low availability of some required data may constitute one of potential risks as the data have not been collected systematically on the Košice region.

The use of IC methodology in the region is perceived to be an indispensable precondition for achieving sustainability and competitiveness in the long term. Building, monitoring and evaluating intellectual capital in the region is important for people who live in the region as well as for the region as a territorial unit.

Nonetheless, it is recommended that certain steps are taken in order to ensure successful and useful implementation of the IC method in the Košice region:

- To raise awareness on the IC method.
- To develop financial schemes related to the region to support technology transfer of good practice examples.
- To support professional staff in management of R&D and technology transfer.

The Košice region represents a home for many successful and inspirational companies. **Nevertheless, without systematic regional or national support combined with the assistance that helps to overcome traditional business barriers, local SMEs will not be able to grow and fully convert their potential into success.** Thanks to the IC method, their strengths and weaknesses can be identified which should help them to boost their business and reach new customers and markets.

Regional authorities – the city and the region of Košice

Author: Ľubomír Billy, Centire on the basis of interviews with Mr. Tapak from the Košice self-governing region and Mr. Vertal from the city of Košice conducted on 27 March 2014

The Košice self-governing region and the city of Košice, as the main representatives at the municipality level, have the best knowledge of the local conditions, current status, problems and challenges of SMEs in the Košice region. As the main policy makers of regional development, they develop and implement various strategic documents also focusing on the sector of SMEs. In addition, as members of the Košice IT Valley collaborating closely with SMEs, they cannot be neglected as crucial actors indispensable for promoting local SME development and key partners of SMEs within the LEGEND project.

Both institutions emphasize the role and importance of SMEs in the Košice region. The IC method can help SMEs to boost their growth – to reinvent their products and processes and to gain new customers and markets – which thus can contribute to development of the whole region. The Košice self-governing region and the city of Košice support many successful local companies with a great potential for the national or even international market. Implementation of the IC method can be viewed as a step forward towards fulfilling a vision of Slovakia as a knowledge economy.

Representatives of the self-governing region identify themselves with the selected driving factors for innovation as they are set in the Košice regional analysis. Based on their knowledge,

they provided up-to-date information for each factor and pointed out that some of the data is collected only on the national level. Moreover, they classify Košice, together with Prešov, to be key employment development poles in Eastern Slovakia. These two cities (as the second and third largest city in Slovakia) can be considered the leaders in the economy based on knowledge and research in the region.

The following factors have been identified as the key drivers expected to influence growth of the innovation potential and employment in the region in the next 5 years:

- Continued urbanization and sub-urbanization of the Košice metropolitan region and the growth of population density.
- Concentration of a critical mass of R&D and university educational institutions in the region; ICT, advanced manufacturing and technology, biomedicine, energy efficiency, combating climate change, recycling and new materials, logistics, creativity and design.
- Strengthening the concentration of skilled labour and high-skilled adaptable human capital.
- Completing high capacity and speed of ICT infrastructure with support services; completing superior highway network, integrated regional transport and modernization of railway transport logistics parks.
- The presence of internationally accredited R&D, competence and technology centres and centres of excellence as well as the presence of science parks – technical and Medipark with technology incubators, high-tech zone in Kechnec and creative hub in Košice supporting creation of engineering expert centres.
- Presence crowd centres, start-up centres and sufficient funds offering resources of all types, including venture capital and other financial services.

In addition, the Košice self-governing region would welcome support of SMEs through a system similar to the fundraising system represented in Slovakia by the Neulogy Company. The Košice self-governing region also perceives lack of key strategic documents on the regional and national levels – a kind of modern industrial public policy. The city of Košice has also identified a need for developing key development documents on the regional and national levels, such as a national development strategy.

Research and academic institutions

Author: Miriam Brašková, Košice IT Valley on the basis of interviews with František Jakab, Director of UCITT, Technical University of Košice

Universities, as key players in research and development in the region, perceive the IC method as an important factor to be analyzed at the regional level. Moreover, in the university sector, it can be used as a tool to understand, to measure and to report on the overall situation in R&D and technology transfer. Higher educational institutions also see their role as a starting point for business activities in the form of start-ups, spill-overs and spin-offs. In this regard, the IC method constitutes one of the key elements and, therefore, it should be introduced widely to Slovak universities and their stakeholders.

The University Centre for Innovation, Technology Transfer and Intellectual Property Protection (UCITT) was established at the Technical University of Košice in 2012. The mission of the UCITT

is to create, develop and support efficient knowledge, product and technology transfer from academic areas into the society and economy in the research and development fields. Regarding the proposed set of IC factors, Mr. Jakab sees all factors to be relevant for further IC development in the Košice region. He considers the human capital as an essential precondition in order to introduce innovations and boost R&D activities. Involving leading personalities and stakeholders in the region may speed up spreading of the intellectual capital concept.

Within the structural capital, the existence of special institutions for technology transfer and knowledge transfer can be considered to be the most important factor among others in this section. However, additional factors can also have strong impact and are relevant for developing the intellectual capital in the Košice region. New technologies coming to the region work as a strong motivational factor for people to consider staying in the region. Such technologies also give users an opportunity to catch up or stay competitive with global leaders in the field.

The region's historical roots can have a very strong impact on its current development stage in the field of IC. In addition, the past establishes starting points for new opportunities. For instance, Košice as a steel-processing and mining region is slowly being transformed into a strong ICT hub. Funding from the regional institutions for R&D and technology transfer could boost technology transfer more significantly and facilitate growth in the local business environment. In addition, special structures for business support facilitating new investments and building connections between business and research environments could be instrumental in the whole process.

City and regional infrastructure – e.g., traffic or public system – increase motivation of people (young in particular) to stay in the region. Without favourable life conditions, they, as a key carrier of IC, will move to the regions with better infrastructure and opportunities. Finally, the base of the relational capital consists of cooperation between all relevant partners. It is extremely important that cooperation with funding institutions, especially with venture capital funds, exists in the region. In the field of policy creation, national governmental institutions have to be approached in order to initiate potential structural changes.

4. CHAPTER 4: RECOMMENDATIONS FOR THE KOŠICE REGION

4.1. FOR SMALL AND MEDIUM-SIZED ENTERPRISES

Author: Mart Kivikas, Wissenskapital

To raise the awareness of intangibles or IC has proven to be crucial in order for any SME to stay competitive. Germany is one of the leading countries in this area in Europe with a proven track record on how to manage IC and to build up a “Mittelstand” – the mid-sized companies. This project builds on these experiences in order to save time and learn from the existing pool of practices. The method of IC management and ECI as its connections to financials will be tested in at least five SMEs in the Košice region with small adaptations to local needs and wants.

Moreover, leading SME will be invited to act as first movers and good practice examples for others to follow.

The region of Košice needs SMEs that are innovating and growing. Nowadays, there is lack of mid-sized companies in the region. Therefore, in order to stay competitive this business segment should be strengthened. In order to do so, an analysis (Intellectual Capital Management and ECI) will show, which companies on site do have these qualities to grow in an innovative way. However, the fundamentals of IC are at the beginning abstract, so intensive coaching is needed to settle the idea strategically within an SME. Due to the recent history in Slovakia, some crucial IC factors are being assessed to be poor. Therefore a stakeholder approach is recommended. Universities, politicians and other regional decision makers should be included into the process from the very beginning. This should mitigate the risk of misunderstandings in the later period and show a commitment towards the process in the long run.

4.2. FOR HIGHER EDUCATION INSTITUTIONS

Authors: Roswitha Wiedenhofer & Christian Friedl, FH JOANNEUM, University of Applied Sciences, Graz

As shown in the previous chapters ICR can be a valuable steering instrument for a HEI due to several reasons, most prominent due to the fact, that HEIs' main inputs and outputs are intangibles themselves, which are hardly covered by traditional strategic instruments. There are some (more selective) examples for utilization of balanced scorecards in HEI's management (e.g. Johannes Gutenberg Universität, Mainz (D)⁵; Montanuniversität, Leoben(AT)⁶), since this instrument also covers a learning and stakeholder perspective, which supports important features of HEIs' organizational anchors.

However, a regional innovation systems (and smart specialization) approach which is based on a tight collaboration of several groups of stakeholders is beneficially served by a common "language" and understanding of driving factors. These basic features are well covered by the concept of ICR, especially the definition of Human, Structural and Relational Capital. As demonstrated by the list of selected driving factors in Chapter 2, the resource base of innovation within a system can be commonly assessed and further supported by developing these driving factors. Stakeholders from economy as well as science can work on "shared" driving factors and focus on them in course of their single institutional strategies (e.g. University-business collaboration and adequate means therefore as part of the structural capital).

Moreover, this key drivers' approach also supports an interactive, participative decision-finding and making process, if implemented as recommended in the "Wissensbilanz – Made in Germany" model (see Part 1 of this report: Wiedenhofer, Friedl (2014): Brief Overview of IC Reporting Development, in: The intellectual capital method: Overview and introduction (Part 1). A result of

⁵Vogt, Th., Lauer, F. et al., „Vom Leitbild zur Strategie - Die Entwicklung des Strategiekonzepts der Johannes Gutenberg-Universität Mainz“, Wissenschaftsmanagement Nr. 2, S. 32-38, 03/04 2002.

⁶ Entwicklungsplan der Montanuniversität Leoben -Wertschöpfung für die Zukunft, verlautbart im Mitteilungsblatt 03.05.2012, Stück 63; [https://napps2.unileoben.ac.at/napps/public/mbl.nsf/MBL%20ver%C3%B6ffentlicht/33F0A8CF90DEF441C12579F30039B3B5/\\$File/MBL%20631112%20-%20Entwicklungsplan%20Montanuniversit%C3%A4t%20Leoben.pdf](https://napps2.unileoben.ac.at/napps/public/mbl.nsf/MBL%20ver%C3%B6ffentlicht/33F0A8CF90DEF441C12579F30039B3B5/$File/MBL%20631112%20-%20Entwicklungsplan%20Montanuniversit%C3%A4t%20Leoben.pdf).

the project: “Leverage knowledge for sustainable innovation and growth” (LEGEND), edited by Olejárová, D., European Commission – Life-long Learning Programme, Brussels: Education, Audiovisual and Culture Executive Agency, p. 4-7). It is foremost the concept of the driving factors that is decisive for the quality of implementation of an organizations’ (and regions’) strategy and taken as a semi quantitative base in the AKWB-model. The driving factors can in turn be underlain by indicators, which allow a more quantitative controlling and monitoring of further developments and improvements of otherwise “intangible assets”. Thus the driving factors are serving as an important link between the overall IC model of an organization (or more general a “system”), its basic theoretical concepts (e.g. the RIS approach was only one of several models serving as a base for the derivation of the selected driving factors, see Wiedenhofer, 2012), strategic intent and measurement.

Comparing the two actual introduced and analysed concepts (AKWB-model and the Austrians HEI’s approach) among others a distinct difference can be found in the fact that the latter of the two approaches does overwhelmingly not cover or make explicit the key driving factors, which govern the behaviour of the HEI system. This also implies that a cause-effect analysis and the determination of several system-theoretically based features of the organisations (relevance of factors, organisational barriers and points of leverage) cannot be accomplished by following this approach. This can clearly be noted as a shortcoming and potential starting point for further development and clear positioning of ICR as a HEI’s strategic management instrument. The reason therefore is quite evident and based in the fact, that the original intent at the time of introduction was a visualization of the IC of HEIs with focus on inter-institutional benchmarking and overall statistics, but only slightly on strategic management and organizational development issues. As shown in the historical introduction in WP 1.1 the AKWB-model is the result of an extensive further development of the basic IC approach, the development of the HEI approach at Austrians universities took another direction much more focusing on operative issues and data collection than on steering and strategic management issues (for the time being).

As depicted within the interview with the Austrian Ministry of Science, the governance of ICR at Austrians HEIs is – despite 9 years of age – still a dynamic process with top-down (ministerial working groups) and bottom-up (universities project groups) initiatives working on the improvement (indicators, steering and performance relations) and international connectivity (international standards of university rankings) respectively of the ICR-concept. Summarizing the recommendations explained in the sections above a “top-down one-fits-all” approach cannot be recommended for a national introduction of ICR at HEIs. As a starting point, the same understanding and prerequisites that are valid for each single institution (and also reflects the authors’ experiences at the FH JOANNEUM) are also valid on a superordinate – national – level.

First the strategic framework and goals for the educational system under analysis have to be defined. Existing steering and incentive mechanisms should be taken into consideration and integrated into the IC framework. Processes and responsibilities of the supraordinate versus the organizational governance structures should be clearly defined and determined. A prototypic IC-report model as a template for a single HEI can be helpful. A common understanding and introduction of key driving factors for the HEI sector could support the strategic intent and usefulness as a steering instrument (especially in the regional development and innovation context).

For the definition of indicators it should be taken into account that a suitable balance between comparability on the national level (common indicators), discipline-specific (e.g. technically oriented vs. medical oriented universities etc.) and HEI specific indicators should be found. The latter should give room for the specific characteristics of the single institutions, its organizational profiles, potentially different ages and degrees of organizational maturity. Finally the whole ICR-process including, planning, data collection, controlling and reviewing must be defined, preferably in a participative manner from the very beginning, preferably following a classical “PDCA”-logic. These procedures shall on the one hand ensure a high quality in implementation of ICR and on the other hand also significantly raise the acceptance and commitment level of HEI actors for a further usage as a steering instrument in Higher Education.

References

Wiedenhofer, R. (2012): ‘Key drivers of technological innovation: intellectual capital view approach’, *Int. J. Transitions and Innovation Systems*, Vol. 2, Nos. 3/4, pp. 283–301.

4.3. FOR OTHER REGIONAL PARTNERS

Author: Lubomír Billý & Daniela Olejárová, Centire

The Košice self-governing region, the city of Košice, the Košice IT Valley cluster, or T-Systems as a large company – in addition to the Košice University of Technology or the Pavol Jozef Šafárik University – represent the key players influencing and forming the environment for SMEs in the Košice region. In addition, in the LEGEND project they are addressed as the secondary target group – the main SMEs partners in their innovation efforts. Although, SMEs are the primary beneficiaries of the LEGEND project, the involvement of the above-mentioned stakeholders is vital for fruitful implementation of the IC methodology in the Košice region. In addition, implementation of the IC methodology can be viewed as a step towards fulfilling a vision of Slovakia as a knowledge economy.

SMEs form a backbone of the national and regional economic development; their presence and support is crucial for development of the entire Košice region. The IC methodology may be one of the tools helping them to know their strengths and weaknesses and identify potentials for further expansion and growth. The Košice region hosts many successful and innovative companies; they are, however, somehow „stuck“ in the phase of the business evolution without being able to innovate products or services and to reach new customers or markets.

The Košice self-governing region and the city of Košice are the main policy makers in the region. Both institutions perceive the selected list of IC factors as relevant for the development of intellectual capital in the region. With the implementation of IC methodology verified with SMEs, it can be later adjusted, elaborated and used for other sectors – large companies or universities. Focus on the IC methodology can also be highlighted by defining the local strategies and public policies. The local governments should also be active in developing systematic regional support with assistance that helps SMEs to overcome traditional business barriers.

The Košice IT Valley cluster – a common platform for SMEs, large companies, universities and local government – also perceives the use of IC methodology as a great benefit for SMEs.

Moreover, from a broader perspective it can be useful for the whole region. In order to ensure the broadest dissemination of IC methodology, the cluster may be an initiator of creating conditions for its implementation – raising awareness on the IC method or stimulating discussion on supporting technology transfer.

In general, it can be concluded that engagement and involvement of key local players is advisable and welcome in order to leverage the IC methodology implementation in the Košice region to a maximum degree. The IC method can initiate a broader discussion on bigger regional or even national levels on the importance of the intellectual capital concept. Moreover, the Košice region will serve as a “test field” for the IC methodology implementation, which eventually can make this region an innovation example in Slovakia.

5. LIST OF ANNEXES

1. Annex 1: National analysis of Slovakia

This project has been funded with support from the European Commission. This report reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.