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Mednarodna revija za management, znanje in izobraževanje *je namenjena mednarodni znanstveni in strokovni javnosti; izhaja v angleščini s povzetki v slovenščini. Izid je finančno podprla Agencija za raziskovalno dejavnost Republike Slovenije iz sredstev državnega proračuna iz naslova razpisa za sofinanciranje domačih znanstvenih periodičnih publikacij.*

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Guest Editor's Foreword

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The Hong Kong Polytechnic University, Hong Kong

'Knowledge has to be improved, challenged, and increased constantly, or it vanishes' says Peter Drucker. Knowledge management is a compilation of methods, techniques, tools, and values which organisations use to acquire, create, develop, share, transfer and apply knowledge to innovate and thus sustain competitive advantages. To adopt knowledge management, organizations require the ability to quickly adapt to the business environment and the learning of relevant new knowledge in response to business problems. As Peter Senge defined, 'Learning organizations are where people continually expand their capacity to create results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning to see the whole together,' thus when an organization absorbs new knowledge successfully and becomes innovative, it is considered as a learning organization. For innovation to occur, knowledge would be best created and transferred in an organisational culture which encourages collaboration and networking. Knowledge sharing facilitates the flow and generation of new knowledge.

Papers in this special issue address a wide range of topics relating to knowledge and innovation management: 'Studying the Aspects of Knowledge Creation in the LAB Studio Model' proposed a learning setting for knowledge creation in university education; and the papers 'The Importance of Attitude to Knowledge and Innovation for Performance of Manufacturing Enterprises Operating Either Locally Or Internationally,' and 'Manageability of Technical Innovation through Technical Property Rights' discuss the issues relating to management of knowledge and innovation at organizational and national levels.

All the selected papers in this issue were submitted to the MakeLearn & TIIM 2016 Joint International Conference with the good intentions to share and discuss the most recent developments in the field of innovation and knowledge management. The papers in this issue were selected through a rigorous selection process, including the double-blinded review process. At this point, I would like to thank the authors who submitted to this special issue and particularly the authors who had made the very good efforts in revising their papers.

Lastly, but not the least, I especially thank the Editor-in-Chief for his trust and as well other colleagues for the excellent cooperation.

Kris M. Y. Law obtained PhD from the City University of Hong Kong for her work on a research project in the field of organizational learning and development and was a visiting researcher at the National Taiwan University, soon after she got the post-doctoral research scholarship from the National Taiwan University. She has published a few books in the field of organizational learning, organizational development and competence development. Her publications are also relating to areas of technology innovation and entrepreneurship, and higher education. *kris.law@polyu.edu.hk*

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Studying the Aspects of Knowledge Creation in the LAB Studio Model

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The organisations of higher education are constantly changing. Universities, colleges, private schools and online universities refine their pedagogical methods and learning models in a competitive market. This article is a study on whether one such model helps students to gain new knowledge. A study of the LAB studio model (LSM), which is a pedagogical model developing connections between working-life based problems and the recognition and development of business-related prototypes and start-up companies, is presented. The LSM, theoretically grounded in a constructivist view of learning with a project-based education at its core, has the key goal of educating entrepreneurial competences in higher education. Based on the case study, comprisinga literature review of knowledge creation and a survey, the qualitative results analysis suggests that LSM offers a promising support for knowledge creation. The results lead to the conclusion that LSM provides support especially for the various modes of the SECI model, such as socialisation and internalisation, and seems to support organisational knowledge creation aspects as well.

Keywords: LAB studio model, interdisciplinary education, knowledge creation, higher education, SECI model

Introduction

There is a demand for professionals who are able to create new knowledge across boundaries of disciplines, professions and perspectives. These so-called knowledge workers are lifelong learners who continually acquire and develop new knowledge (Cremers, 2016, p. 11). Universities and institutions for vocational education are all challenged to educate these knowledge workers to rapidly changing industry landscapes, where technologies, knowledge and skills obsolete in an ever-faster pace. This means that meta-learning skills and innovation skills are crucial for students (Juvonen, 2014). In addition, governmental funding for higher education has also been decreasing in Europe (European University Association, 2012). This means that new, more effective forms of learning are required. At the Oulu University of Applied Sciences (OAMK) these challenges have been recognised through the establishment of the LAB studio model (LSM). The LSM is a

higher education, interdisciplinary education model utilising studio based learning (Bull, Whittle, & Cruickshank, 2013) and aimed at training competent new professionals, self-directed teams and new businesses with an industry focus.

Today, learning is generally seen as both constructive, i.e., learning is done on top of previously gained knowledge (Tuomi, 1999), and cognitive, i.e., learning is a mental process influenced by intrinsic and extrinsic factors (Kim, 2005). One way to understand learning is to look at it through the concepts of knowledge – as we learn we gain new knowledge. In IT literature, knowledge is defined usually by distinguishing between knowledge, information and data. Data is seen as raw numbers and facts, information as processed data and knowledge as personalised information. What is important in this classification is the distinction of knowledge and information. Knowledge should be something more than information – otherwise there is nothing new or interesting in knowledge management (Fahey & Prusak 1996). Thus, following Tuomi's (1999) view Alavi and Leidner (2001) state, 'information is converted to knowledge once it is processed in the mind of individuals.' In this view, knowledge is information plus something more. This 'something more' is the associations, memories, past experience – previous knowledge that the individual possesses – that are related to the information. In this regard. knowledge is 'information possessed in the mind of individuals: it is personalised information' (Alavi & Leidner, 2001). An interesting part of this definition is that 'knowledge becomes information once it is articulated and presented in the form of text, graphics, words, or other symbolic forms' (Alavi & Leidner, 2001). So knowledge does not exist without individuals. As such, constructive and cognitive learning plays a key role in knowledge creation. From an educational point of view, it is important to find pedagogical methods that help students to learn and generate new knowledge. Studies about knowledge creation and its methods applied to higher educational settings are done by, e.g., Omona, van der Weide, and Lubega (2010), Yeh, Huang, and Yeh (2011), Biasutti and Heba (2012), and Cheng, Ho, and Lau (2009). Despite the growing interest towards higher education settings utilising studio based learning – e.g., Carter and Hundhausen (2011), Bull and Whittle (2014), and Bosman, Dedekorkut, and Dredge (2012) – they are not studied by the theory of organisational knowledge creation. In this article, a study of the most commonly referred organisational knowledge creation theory, SECI model (Nonaka, 1994; Nonaka & Takeuchi, 1995), as part of LSM utilising education program, more specifically the case Oulu Game LAB (OGL), is introduced. As the studio learning models emphasise learning in interdisciplinary teams and projects, this paper focuses on organisational knowledge creation. For this, SECI model provides the theoretical background. The research question is defined as:

Does the LAB studio model have support for the most common knowledge creation model as identified by the literature? In the second section organisational knowledge creation is discussed. In the third section the LSM for higher education is introduced and in the fourth section the LSM is analysed through the literature review of knowledge creation theories and the interview study. Finally, the fifth section discusses and concludes the paper.

Organisational Knowledge Creation

There are many different models and theories trying to explain how new knowledge is being created. For an excellent review, please see Alavi and Leidner (2001). Nonaka, Toyama, and Konno (2000) state that 'knowledge is created in the spiral that goes through two seemingly antithetical concepts such as order and chaos, micro and macro, part and whole, mind and body, tacit and explicit, self and other, deduction and induction, and creativity and control.'

The dynamic theory of organisational knowledge creation, also called the SECI model, has four modes of knowledge conversions that are created when tacit and explicit knowledge interact. The modes are (Nonaka, 1994; Nonaka and Takeuchi, 1995) socialisation, externalisation, combination and internalisation, as illustrated in Figure 1.

Socialisation is a process of sharing experiences (Nonaka, 1994). It creates new tacit knowledge from existing tacit knowledge. For example, by observing a colleague, the observer can learn through imitation or practice. Typically the new tacit knowledge is in a form of shared mental models or technical competences. *Externalisation* is a process of articulating tacit knowledge into explicit concepts (Nonaka, 1994). Externalisation is the key

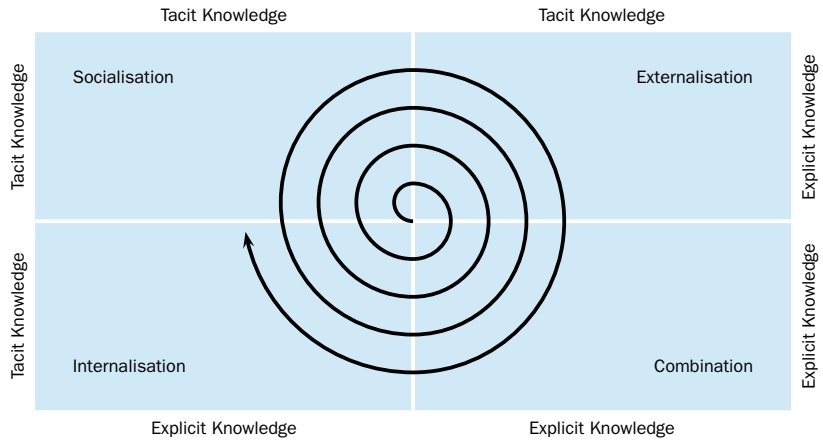

Figure 1 The SECI Model of Knowledge Creation

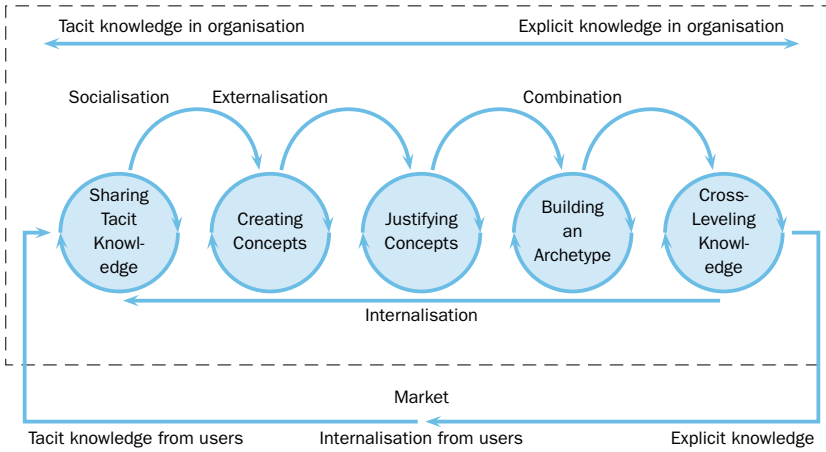

Figure 2 Five-Phase Model of the Organisational Knowledge-Creation Process (adapted from Nonaka and Takeuchi, 1995)

process in the theory, as it is the process that creates new explicit concepts from the tacit knowledge. *Combination* is a process of systemising concepts into a knowledge system (Nonaka, 1994). It creates new explicit knowledge from existing explicit knowledge. It is the kind of knowledge creation that happens in formal education or training at schools. *Internalisation* is a process of embodying explicit knowledge into tacit knowledge (Nonaka, 1994). Reading documentations or watching videos is an example of the kind of 're-experiencing' that internalisation requires. Also 'learning by doing' can be seen as an example of internalisation.

In addition to SECI, Nonaka and Takeuchi (1995) also provide a five-phase model of the organisational knowledge-creation process. The model consists of the following phases: sharing tacit knowledge, creating concepts, justifying concepts, building an archetype and cross-leveling knowledge. Figure 2 illustrates the process.

As organisations cannot create knowledge by themselves the knowledge creation starts by harnessing the tacit knowledge residing in the individuals, *sharing tacit knowledge.* This phase matches with the socialisation mode of the spiral. The second phase, *creating concepts,* uses collective reflection to verbalise the shared mental models into words and phrases and, finally, into explicit concepts. The externalisation mode of the knowledge creation spiral is similar to the creation of concepts-phase. As these concepts are created, the organisation must screen them in order to justify the 'true beliefs' among the rest. This third phase, *justifying concepts,* does not have equivalent in the knowledge conversion modes. The organisation needs some sort of criteria for the justification. For example, some con-

Table 1 Models and Aspects Related to Knowledge Creation Identified

Aspect	Description
Socialisation	Sharing experiences, creating new tacit knowledge from tacit knowledge.
Externalisation	Process of articulating tacit knowledge into explicit concepts.
Combination	Creating new explicit knowledge from existing explicit knowledge, combining existing knowledge into new knowledge.
Internalisation	Process of embodying explicit knowledge into tacit knowledge.
Creating concepts	Collective reflection to verbalise the shared mental models and into explicit concepts.
Justifying concepts	Process of justifying that the created concepts are true.
Building an archetype	Build a prototype of the product under development.
Redundancy	The existence of information that goes beyond the immediate operational requirements of organisational members.
Requisite variety	Combining information differently, flexibly, and quickly, and by providing equal access to information.
Justifying concepts	Process of justifying that the created concepts are true.
Building an archetype	Build a prototype of the product under development.
Cross-leveling knowledge	Move the justified concepts on to another ontological level where new knowledge creation process can begin.

Notes Adapted from Nonaka and Takeuchi (1995).

cepts may be too expensive or otherwise not feasible. The justified ones can be taken to the fourth phase, *building an archetype,* which can be a prototype of the product under development, for example. As the prototypes are usually built by combining existing knowledge with the newly built concept, this phase is close to the knowledge conversion mode of combination. The fifth and final phase of the model is the *cross-leveling knowledge.* In this phase, the newly created, justified and modelled concept moves on to another ontological level where a new cycle of knowledge creation process can begin.

In Table 1 the aspects identified in the literature review are displayed. Sharing of tacit knowledge is omitted because it is equal to the SECI model of socialisation.

Collective reflection to verbalise the shared mental models and into explicit concepts. Justifying concepts Process of justifying that the created concepts are true. Building an archetype Build a prototype of the product under development. Redundancy The existence of information that goes beyond the immediate operational requirements of organisational members. Requisite variety Combining information differently, flexibly, and quickly, and by providing equal access to information. Justifying concepts Process of justifying that the created concepts are true. Building an archetype Build a prototype of the product under development. Cross-leveling knowledge Move

the justified concepts on to another ontological level where new knowledge creation process can begin.

The LAB Studio Model Introduced

The LAB studio model (LSM) is an interdisciplinary higher education model aimed at training competent new professionals, self-directed teams and new businesses with an industry focus. In general, the LSM can be defined as a business pre-incubator, created to produce promising teams with solid and proven potential for creating their own new business (Heikkinen, Seppänen, & Isokangas, 2015). As a pedagogical structure, the LSM utilises the studio based learning (SBL) for its pedagogical model. SBL can be defined as an instructional strategy that provides students with opportunities to engage in relevant, authentic learning in a school setting (Boyer & Mitgang, 1996; Burroughs, Brocato, & Franz, 2009). The recent study by Heikkinen and Stevenson (2016) has shown LSM to include several new factors compared to the existing definition of SBL by Bull et al. (2013). These factors include: the offering a form of instruction that is more competitive in structure in contrast to other studio models; integrating experienced professionals and coaches from the industry; including problems or ideas directly from targeted industries; and building interdisciplinary project teams that cross professional and higher education faculty boundaries. The project teams are diverse as they are interdisciplinary, intercultural and intergenerational. This wide range of experience and expertise is expected to cover the key areas of competences necessary for establishing new ventures (Timmons & Spinelli, 1994), start-up companies for the industries in focus.

LSM development process consists of two main parts: a concept development part called LEAD and a demonstration development part, called LAB. In the LEAD-part, students produce concepts needs provided by existing companies or organisations or by the participants themselves. Individuals are organised into groups associated with a particular idea and then engage in a process of concept design. The teacher's role is that of a coach and in most cases students have to solve the problems themselves, as coaches will help but only as little as needed. The process of concept design in the LEAD-part places considerable effort into finding the ideas that hold potential market value. This is done through the use of an internal competition process. The developed concepts are presented in a specific event named Gate 1 and Gate 2, where some of the projects are cancelled simultaneously as some of projects continue and new teams are formed in order to start building a demonstration of their concept. The decision of the continuing projects is done by a group of external judges consisting of industry professionals. In the LAB-part, teams set after the last stage of LEAD-part, develop demonstrations (demos) of the concepts including so-

lution and the business related-model. Roles within the development team are defined and effort is put into both demo development and individual's professional skill development. The LAB-part ends with an Expo-event, which is an event for all students meeting professionals from the industry. In the event, student teams present their solutions and business models with the aim of receiving customer-oriented and professionals feedback.

LAB studios (LABs) are established around a certain industry theme meaning that LABs are filled with participants having a common interest in a particular industry. The common interest towards certain industry is helping students with different cultures, experience and professions to interact with each other. This connection with the work-life is emphasised by organising common events, seminars and happenings, where social interaction, networking, non-formal peer-coaching and critique or constructive feedback is promoted. Representatives from the focus industry frequently visit LABs, so thus these visits are often used for industry feedback opportunities, during which teams present their progress by demonstrating prototypes and asking for feedback, which in turn can lead to coaching from the visiting specialist. In order to support a climate of critical consciousness, feedback in LABs is given to individuals and to groups during formal and informal sessions. In this way, giving and receiving feedback is a regular part of LAB studio daily activities. Formal project feedback is also given during weekly progress reviews where participants are invited and peer-feedback is given. A LAB studio assessment is completed at the final phase of the LAB in a development discussion, where the student, team leader, profession coach and possibly also the project coach can be present. The discussion is a good opportunity for giving and receiving constructive feedback for reflective practice (Schön, 1983, 1987). The main focus of these discussions is on increasing the professional and personal development of the student (Heikkinen & Stevenson, 2016). Common events are arranged for enabling networking and project introductions between students and coaches. Mostly the students arrange also impromptu kinds of events for project feedback sharing. Excursions to industry companies or events are also an excellent opportunity for receiving feedback. Experiencing real-world contexts and meeting industry professionals give students an opportunity to reflect their own professional competences and work.

LSM is strongly focused on having students in a business-orientated location separate from the main campuses of the university. It is this choice that allows for the LAB studio to support the impression of being in a work environment as opposed to a university environment. The physical LAB studio space is located in a downtown urban area, in a small company-like open environment, as the target is that students treat the studio as their own company. Project teams arrange the LAB studio premises, including the

seating structure and space usage, according to their needs and organise their work independently. The working space consists of rooms of differing sizes for the project teams and individuals (Bull et al., 2013; Heikkinen & Stevenson, 2016). Facilitation of a LAB studio is principally the LAB master's and LAB coaches responsibility. The LAB master is a person belonging to the staff who is responsible for the LAB's activity and functions as a contact person for cooperation partners. The LAB coaches are teachers who, through their own professionalism and contacts, participate in both teaching and tutoring of teams. However, in practice, the studio belongs to the students and staff only suggest the use of the LAB studio. Access to the premises enables work in the evenings and weekends. Since the mode of pedagogy heavily relies on coaching, staff availability is a priority (Bull et al., 2013; Heikkinen & Stevenson, 2016). While the notion of coaching is not unique to the LSM, the interaction between staff and students draws heavily from working life interactions, rather than traditional instructor relations at the higher education level.

The key mode of education in LSM is a constructivist approach, utilising project based learning (Blumenfeld et al., 1991). Since projects aim to create a real demonstration of their solution, the approach of learning-by-doing, initially promoted by John Dewey (1897), is also a critical pedagogical principle of the model. Each student and profession in that project team is served by coaching specifically targeting these different roles. In addition, projects are also served by mentoring to ensure an industry customer relationship (Carnell, MacDonald, & Askew, 2006). The coaching and mentoring is performed by the teachers according to their skills and strengths and, in this way, the learning process is viewed as a process of learning, and building knowledge is shared within and among professions as peer-learning (Boud, Cohen, & Sampson, 1999; 2014). Furthermore, knowledge is generated in cooperation among students, coaches and work-life partners, forming a community of learners (Brown & Campione, 1994; Rogoff, Matusov, & White, 1996). The role of coaches and tutors as supervisors of learning is to direct the students to find and build new knowledge and to commit them to work toward the promotion of learning. Additionally, coaching often requires the improvisation of teaching (Sawyer, 2004). In LABs the improvisation of teaching is seen as a variation of the methods used at the moment of coaching and, thus, can enhance knowledge creation. The main characteristics of the LAB studio model are summarised in Table 2.

The LSM can be utilised in educating professionals for various areas of industry and currently is utilised in software applications and game industry education. Oulu Game LAB (see http://www.oamklabs.fi/oulugamelab) is an example of the implementation of the LSM tailored for the game industry

Table 2 Aspects to the LAB Studio Model

Aspect	Description
Studio Model of teaching	Instructional strategy that provides students with opportunities to engage in relevant, authentic learning in a school setting.
Critique	Formal and informal, direct and constructive feedback, industry based feedback, peer-feedback, development discussions and reflection.
Internal and work life events	Events held between LABs, excursions to industry companies, participating to the industry events and conferences and impromptu events.
Culture	Culture of excellence, common values: care & trust, commonly created work ethic, treated as an own company, permission to fail, climate of trust, 'Bazaar' of activities, tolerance of ideas and Master-Apprentice learning.
Modes of education	Project- and problem-based learning, learning-by-doing, peer-learning, community of learners, coaching & mentoring, impromptu teaching, competitive structure and development discussions for professional development.
Physical environment	Open, company-like environment, reconfigurable furniture and spaces, students control aesthetic factors and shared, individual, social and private spaces and location in city center.
Facilitation of studio	Studio belongs to the students, the students create the rules, 24/7 access and high availability of staff.
Start-up company, pre-incubator style	Concept development, prototype development and business opportunity, coaching for business development.
Diverse teams, 3 i's	Projects are interdisciplinary, inter-generational and intercultural with a common interest towards the focus industry.
Collaboration	Teamwork and leadership is supported by physical environment and social media, entrepreneurial thinking.

Notes Partly adapted from Heikkinen and Stevenson (2016).

needs. Other possible focus areas include urban environment, healthcare and energy.

Case Study of Oulu Game LAB

Methodology

A qualitative case study method was chosen for the study. According to Creswell (2012) and Yin (1994), a case study can include either quantitative or qualitative evidence, even both, and it usually relies on multiple sources of evidence and benefits. For the benefit of the data collection, the LAB studio model (LSM) operates in one physical environment and thus it is relatively easy to invite participants for an interview. In addition, LABs have a constant flow of students and coaches participating and both are staying at the university after the studies in LABs. Since the Oulu Game LAB (OGL) has been developing the model for the longest time, over three years, it was chosen for the LSM environment to be studied.

The study was conducted in two parts. First, a comparison study using a literature review was made for understanding how different aspects of organisational knowledge creation identified in literature relate to the characteristics of OGL. Three researchers made the comparison study and the results were presented in an international knowledge creation workshop in October 2014. Secondly, student feedback surveys were conducted to get more insights into the knowledge creation processes. In these surveys, the aspects of the SECI model were on a focus, as the other aspects of the organisational knowledge creation are considered to support it. A total amount of 72 students were surveyed individually while taking part of the OGL during the years 2013 and 2014. The survey was carried out as an electronic web survey, where the questions were of open type. After uploading all the 648 answers to the Nvivo-tool, researchers read through all the individual answers and made a keyword match to find similarities between them.

Findings of the Comparison Study

The results of the comparison study by Räisänen, Heikkinen, and Stevenson (2014) suggests that the LSM overall offers good support to most of the aspects related to knowledge creation. Furthermore, the results suggest that LABs offer a potential environment for knowledge creation in the infrastructure point and learning point of view. Critical aspects of the study suggest that for LSM will be a challenge to find suitable locations and find coaches with relevant knowledge. This is due to that the fact that the LABs are based optimally in a physical place that stimulates a start-up mentality and where coaches encourage participants to interact with the particular industry.

Findings of the Student Survey

Based on the survey, it was evident that the LSM supports socialisation to a great extent. The students were divided into interdisciplinary teams that worked on their game ideas. For socialisation, it would seem that the *interdisciplinary* nature of the LAB was the biggest benefit. Working with other disciplines is a good source of tacit knowledge, as it is very beneficial, e.g., for a graphic designer to see how a programmer thinks and vice versa. In addition, students worked together with *like-minded* and talked with like-minded professionals. All the students in the survey felt that the OGL provided them with an opportunity to experience what game development is like in a *company-like environment.* For the socialisation, the experience and the environment was probably the main source of tacit knowledge. Lastly, one other aspect of socialisation and working together that was not so evident was that students were *building networks* for learning. The excursions to the

Table 3 Socialisation Aspects and the Supporting Quotes from the Survey

Aspect	Quotes from the survey
Interdisciplinary	'The experience of working in such interdisciplinary teams is something that is just not learned in most schools and as such is very good to experience.' '[gain] learning good working practices, an understanding of the industry, and how other disciplines work within it.' '[I learned the] difference of artistic ways versus technical methods.' 'The creative process that brings different things together from different creative aspects.'
Like-minded people	'[meeting] other people who have an energy and drive for their passion as you do.' 'Talk with the professionals [. . .] Good tips, stuff about the same ideas we are working, [. . .] more like socialising.' 'This is probably the first time that professionals from the game industry give you feedback and you get to talk with them and hear them talk about what they have on their mind.' 'It's always nice to meet new people, you reach in your lives new people when meeting, and it's nice to use them in your script writing.'
Company-like environment	'[It's an] unique opportunity to experience what game development is like, in an environment that's very close to working in a real game company.'
Building networks	'Making existing and future contacts within the field.' '[The industry events are] really great and helpful, as it showed the important social part of this area of business.' 'If you are too afraid to open up, you can not succeed.' 'The parties are good for socialising.' 'We went bowling and got familiar with each other. It was a bonding moment.'

industry events and parties arranged were also considered to be beneficial for the socialisation. While this was not directly beneficial to knowledge creation processes it would surely be important later on in their careers. Table 3 presents the findings of socialisation aspects and the supporting quotes from the survey.

The LSM does not explicitly emphasise externalisation, instead externalisation happens naturally by working and collaborating together, and many aspects in LSM support it. The teams had to produce high-level concepts of their ideas, as well as prepare elevator pitches and presentations about the games. When students were designing the game concept, they felt that sharing was crucial as it helped the teams develop their ideas further. *Sharing* plays a major role in externalisation. Some students also indicated that they liked the *peer group meeting* (e.g., all the programmers had weekly meetings where they discussed the problems they had faced). Within these weekly peer group meetings, externalisation was probably easier than normally. The reasoning for this is that people in these peer groups had similar backgrounds and knowledge so articulating tacit knowledge might be easier than with somebody with no relevant background. Besides peer group meetings, *presentations* were also excellent places for sharing ideas and giving feedback. Table 4 presents the findings of externalisation aspects and the supporting quotes from the survey.

Table 4 Externalisation Aspects and the Supporting Quotes from the Survey

Aspect	Quotes from the survey
Sharing	'The fact that you should share ALL the ideas that you get, even the stupid ones because someone else can improve that stupid idea to a great idea.' '[. . .] marketing was missing, I had experience about it, [. . .] Yesterday [I was] sharing experiences about the marketing, very good for covering the marketing tasks.' 'I don't think we'd get this far without having feedback from outside.' 'You have to let let others influence to your work. Discover influences anywhere.'
Peer group meeting	'[The most beneficial were the] peer-group meetings on certain weekdays and the ways people crushed my soul.' 'Working in group with people I didn't know before.' 'Neighbours [students] are helping by giving feedback. Like how the figure fits into the game.'
Presentations	'Presentations are good learnings.' 'You learn via that feedback, it's really, really useful. Better products are coming via these testing sessions.' '[. . .] was a really beneficial in the end, it forced us to create a condensed package of our game, and present it.' '[. . .] good game idea is not enough. You also need to know how to know how to implement and present it, not just to your own team and company but also to the investors.'

Again interdisciplinary teams seem to provide a good starting point for combination. By working together, students were able to learn how to focus their initial ideas and combine them into the design concept. *Designing high-level concepts* seemed to require the most combination. All team members had some ideas and solutions and it was up to the teams to combine them into one, at the same time this was a challenge and opportunity for the teams. Some students indicated that they had gained understanding of the big picture and the whole meaning of the concept development. This could indicate that they managed to see how their own and their colleagues' competences and knowledge relate to game industry and game design. During the *development,* understanding new knowledge from other disciplines caused new learning in one's own discipline. Table 5 presents the findings of Combination aspects and the supporting quotes from the survey.

In OGL internalisation was best characterised by learning-by-doing. Since OGL students are mostly third-year students they all know that software is done in teams and projects. It is still interesting to see that while they knew it they had not internalised it before OGL: working with actual projects with actual deadlines made them realise the importance of *teamwork* and leadership. Another simple thing that students had not internalised was *communication.* Everybody knows communication is important but usually students fully realise it only after they run into some problems with it.

As part of the learning-by-doing, students are also required to make most decisions by themselves. This causes them occasionally to make mistakes but in most cases this was another source for learning. Indeed *fail fast, fail*

Table 5 Combination Aspects and the Supporting Quotes from the Survey

Aspect	Quotes from the survey
General	'[OGL is] all about transferring your existing skills to the computer games industry and acquiring new skills along the way.' 'I'm today looking games differently, from the mechanics point of view.'
Designing high-level concepts	'How to get a concept together from an idea working with the game design document, especially [. . .] with new people in the team. It showed how much it helps having assistance when working with such thing. Also on the other hand it showed what happens when several designers have slightly different views on the same game feature or mechanic.' 'Recalibrating your first idea with new team mates.' 'Understanding the big picture [and] the whole meaning of the lead phase.' '[He] gave us Game Design angles hints, and we didn't take his advice. We were almost eliminated because of our wrong choice. So actually he gave us some good notes.'
Development	'I guess I've learned a little bit little bit how programmers think and how, I think [. . .] I know in this point that what I'm doing.' '[he] helped to reduce the amount of code by the sound design.' '[he] introduced new SW-tools for me, but I didn't take them then. Few weeks ago I took his recommendation and I see now what he means. He's little bit of a mentor, it's really needed.' 'I like my role as an artist here, even though my style is different than needed, and it took awhile to unite it. Now I understand how I should make the pictures. I learned a lot how to adjust my style to the need.' 'I met lot of professionals in Kajaani, I usually don't make notes, but now I had to make notes. I took those tips into use.'

often is one of the key elements of the LSM and it seems to be good for internalisation. Table 6 presents the findings of Internalisation aspects and the supporting quotes from the survey.

LSM supports the organisational knowledge creation by its development process. The LSM starts by students *creating concepts* including a solution and a business-related model to a recognised need. During the concept development, students were sharing their experiences freely in a dialogue withothers and external participants, as they own the rights to their work. *Justifying concepts,* as well as *building an archetype* concept, play a major role in the LSM development process. Gates were considered to be one of the most beneficial moments of learning. Especially the provided professional feedback, i.e., justifying, of their developed concept was seen as a learning moment. At the same time, the amount and quality of the feedback was not considered to be equal for all. Project cancellation at the Gate caused some disappointments, which, however, was considered to be a good learning moment. In the LAB-phase every team and student are involved into the development process, where they can utilise their skills in order to turnthe concept into real. The prototypes are tested by the external for receiving feedback, which is then analysed for further develop-

Table 6 Internalisation Aspects and the Supporting Quotes from the Survey

Aspect	Quotes from the survey
Learning-by-doing	'Working with the project was the main source of education.' 'Helped a lot to realise that without teamwork and leadership it is really hard to achieve good work.'
Teamwork	'[. . .] working with other is mostly [difficult], but you somehow you have to manage the "More-people-more-chances-to-go-wrong'-ratio." 'The teamwork lessons [. . .] helped a lot to realise that without teamwork and leadership it is really hard to achieve good work.' 'Greatest challenge for me was leading teamwork. I failed that, but learned so much.'
Communication	'I think in this first few weeks the main part that I learn was: communication; communication with people with different backgrounds, nationalities and working-fields.' 'Learned communication by mistakes.' 'Mostly our problems are communication problems.' '[. . .] communication could have been better. But OGL cannot do everything for us, we have to learn to ask our self too.'
Learning after failing	'Mistakes and such were beneficial and it's good that they were done.' '[. . .] because of rapid action failures are revealed quickly. That's effective way of turning theory to something concrete.' 'Best way to learn is by doing so I consider all the time spent on the development of the projects to be the most beneficial, fail fast.'

Table 7 Aspects of Organisational Knowledge Creation and the Supporting Quotes from the Survey

Aspect	LSM process and Quotes from the survey
Creating concepts	*LEAD-part.* 'Thinking outside of the box and bravely using own ideas was encouraged.' 'The concept development was a really fun and creative part of OGL. So many great ideas came up, yet so little time to realise them.' 'I really liked to do the concept development but I feel a little more guidance would be on its place.' 'I think that the first month (the concepting part) was the best and also the worst part of the whole course.'
Justifying concepts	*Gate-events and other organised events. Feedback given by peers, coaches and externals.* 'The gates were really good milestones and gave deadline for the concept work. Got really good feedback from professionals from game industry and trained for public appearances and pitching.' 'Gates were exciting, terrifying and a good learning experience. It was great to hear honest feedback about your game ideas, especially on gate 2.' 'Gate scores and feedback didn't really correlate. Lots of unexpected things happened.' 'Again, failure and how to climb back up from that deep and dark hole is most beneficial way of learning to me.'
Building an archetype	*LAB-part.*
Cross-leveling of knowledge	*Expo-event.* '[. . .] was giving really straight feedback from our game, e.g. pointing out the importance of business understanding. She was shaking her head when almost everybody told that they wanted to do a just a game instead of making money with it. Positive experience without drama.'

ment. The survey did not include questions about the demo development part. *Cross-leveling knowledge* can be seen happening in the Expo-events, where customer oriented and professional feedback is received from the industry professionals. Students respected the given feedback at the Expo-event.

Conclusion

In this paper it was studied how the LAB studio model supports knowledge creation and different aspects related to it. To achieve that, the LSM for higher education was presented and the model supporting the SECI model and organisational aspect of knowledge creation as identified by literature was investigated. Results from a case study of Oulu Game LAB were achieved by analysing the collected data from a survey among the students of the OGL. The results would indicate that LSM provides good support for SECI model and organisational knowledge creation.

Based on the results of the survey and by the comparison of how the LSM matches with knowledge creation, we propose that LSM offers a promising support for aspects of knowledge creation, especially the SECI model seems to be well supported. For example, socialisation is about working together and teams solving problems, and, more importantly, making mistakes together and learning from them. Actually, those shared mistakes often are important sources for their learning. In addition, the process of LSM seems to support organisational knowledge creation. These suggestions would indicate that traditional classroom is not the optimal form of education from knowledge creation perspective. The more we can get the students to actually work on actual projects the better it is for knowledge creation. If we critically look at the LSM, a lot of the success is based on the location of the LAB studio, as well as the expertise of the coaches. Also, as in this paper we focused on game industry education, the results might not apply in other fields of education.

As an implication of this study, the studio-based learning is promising for knowledge creation purposes. Students work in teams and they learn both industry-specific knowledge, as well as knowledge and expertise related to their own field of study. This is important as the students get to practise previously acquired skills and knowledge in an environment more similar to work life. This might raise the question whether the opposite might also be true, since it might not be optimal to use studio-based learning to learn completely new skills or knowledge from their own field of study. For that case traditional way of learning might be more suitable. Managerial implications for higher education could be that the first three or four years should be planned for learning skills from the students' own field of study and studio model type of learning could be applied for the rest of their studies.

The study indicates also that LSM is worth of more investigation from the area of knowledge creation. For future research, we propose the rest of the knowledge creation theories by Nonaka and Takeuchi (1995); Ba and Enabling Conditions, should be studied. Also, as in this paper, we focused on game industry education; in future research, the results provided by this study should also be tested in other industry sectors.

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The Importance of Attitude to Knowledge and Innovation for Performance of Manufacturing Enterprises Operating Either Locally Or Internationally

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Today knowledge management actions and innovation processes are very specific and complex topics. That is why this publication is focused on small and narrow aspect of these issues – their perception in only one category of entities, which are manufacturing companies. This paper analyzes and compares the attitude to knowledge management and innovation amid manufacturing enterprises operating locally only or internationally. It also checks the influence of various approaches to studied issues on creating mentioned businesses' competitive advantage. Empirical study, in which 331 companies took part, has shown that enterprises in international process appreciate knowledge management and innovation more than their counterparts operating only on the local markets. Moreover, the research results demonstrated that knowledge and innovation appreciation by managers and employees is important for competitive advantage of every kind of manufacturing enterprises. Nevertheless, it is crucial to remember for those firms involved on foreign markets – the more a company is engaged in international operations the more attention it should pay to its knowledge and innovation processes.

Keywords: knowledge, knowledge management, innovation, manufacturing, internationalization, competitive advantage, competitiveness.

Introduction

The goal of this article is to examine the attitude to knowledge and innovation in manufacturing companies operating locally and undergoing the process of internationalization and to investigate how the perception of these issues affects the creation of competitive advantage by manufacturing companies with various scales of operations.

Economic changes that we have witnessed in the recent decades – the increasing intensity of globalization, the growing importance of knowledge, often referred to as knowledge-based economy – pose new challenges for companies. To remain competitive they need to manage their knowledge resources much more effectively and must constantly innovate. The situation

in this respect often differs depending on industry. That is why the focus of this article is narrowed down to manufacturing companies. In the recent years there has been a lot of research interest in the service industry, reflecting its growing importance. Nevertheless, the manufacturing industry is still very important but knowledge and innovation issues have not been so well studied in this type of companies.

Another characteristic of many present-day companies is that they often need to expand their operations to other countries to develop and remain competitive – they need to start the process of internationalization. It is a very demanding course and, as can be expected, it requires even more concentration on knowledge and innovation. In fact, effective actions in these areas are more important for them to remain competitive.

The problem area described above covers a number of broad issues. That is why this article concentrates on a narrow aspect, namely attitudes to knowledge and innovation processes that pervade companies. An appropriate attitude of employees is the first step in creating proper knowledge management and innovation processes. The task of organizing this sort of activities is very complicated and delicate and cannot be executed effectively without being perceived as an important step: when the management and employees do not consider these processes as important they cannot conduct them well.

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Literature Review

One of the most important developments that has shaped the conditions in which present-day companies operate was the fundamental change in the role of knowledge in economic processes (Nijkamp & Siedschlag, 2011, p. 15). While the importance of this resource in the past cannot be denied, now its role has become 'dominant' (Welfe, 2007, p. 9). This development was already recognized by OECD in 1996 in a report entitled 'Knowledge Based Economy' (OECD, 1996, p. 1), which popularized the term. Nevertheless, in the literature there is no single, commonly accepted definition of knowledge-based economy (Karlsson, Johansson, & Sough, 2006, p. 12). In general, knowledge-based economy is characterized by the development of fields related to information processing, high technology and information society (Moszkowicz & Kubiński, 2010, pp. 133–134). In this economy, the human brain is a very important or even the main asset for companies (Bratianu & Dinca, 2010, p. 219). Recent decades have also seen the growing popularity of the word 'innovation.' In the literature one can also find the term 'innovative economy' or similar ones. Gaczek (2009) emphasizes that many authors use this term without the explicit assumption that proper

knowledge processes are an essential and inseparable element in creating innovation.

In order to remain competitive, companies need to adjust to emerging economic conditions. They need to make a more effective use of the knowledge they have collected (Handzic & Zhou, 2005, pp. 3–4), as this resource determines the success and even the very survival of modern firms (Jashapara, 2006, p. 24; Paliszkiewicz, 2007, p. 35). Some studies even conclude that average companies use less than half of the knowledge they have (Kowalczyk & Nogalski, 2007, p. 103). There are many concepts that have been created in order to help companies in this respect (Soniewicki, 2015a, p. 45). Nevertheless, the most popular one is knowledge management. It is understood as a response of companies to changes in the global economy (Handzic & Zhou, 2005, p. 3). In the literature there are many definitions of this concept; arguably one of the best was formulated by Paliszkiewicz (2007), who describes knowledge management as a 'systematic and organized process of finding, acquiring, transfer, use and saving knowledge resource that uses adequate technologies as well as cultural elements in order to improve the company's performance' (p. 38).

Nevertheless, knowledge management for a present-day enterprise is only a tool. It is the tool that helps companies to operate more effectively, particularly by supporting innovations. In the past, firms could produce the same product for years in almost the same form. Today this strategy is no longer viable. Companies very often have to update their product or even entirely change their offer. They have to constantly innovate.

Companies' innovativeness is deeply connected with their knowledge management. Many authors underline that properly organized knowledge management processes increase enterprises' innovativeness (Hawryszkiewicz, 2010, p. 77; Ahmed, Lim, & Loh, 2002, p. 4; Koskinen & Pihlanto, 2008, p. 25). Wickramsinghe and von Lubitz even regard this concept as the key element in maintaining innovation in a company (Bali, Wickramasinghe, & Lahaney, 2009, p. 1). Liebowitz even describes knowledge management as 'innovation catalyst' (Liebowitz, 2008, p. 4).

Gaczek (2009, p. 27) points out that a knowledge-based economy differs from an industrial economy, which was dominated by manufacturing companies. Nowadays these companies are still important, but researchers, especially as far as knowledge is concerned, have concentrated on service companies, where the importance of knowledge is obvious (Grönroos, 2005, pp. 8–9; Soniewicki, 2014, p. 2, 2015b). However, in the literature it is also emphasized that knowledge should be regarded as a 'unique production factor' (Szromnik, 2013, p. 9). Pasher and Ronen (2011, pp. 1–2) consider knowledge management to be a helpful tool for companies in creating new products. The importance of knowledge management activities

for manufacturing companies has been recognized by the Economist Intelligence Unit (2007). Nevertheless, the issue of knowledge has not been well examined in the context of manufacturing companies (Soniewicki, 2015b).

Knowledge management, innovation and their influence on companies' performance are very broad matters, so this article concentrates only on one aspect – the attitude towards and awareness of these issues among the staff of manufacturing firms. In fact, a number of companies do not understand the idea of knowledge management (Ahmed et al., 2002, p. 5). Moreover, the lack of awareness of the importance of knowledge in companies is one of the common barriers inhibiting knowledge flow in companies (Anantatmula, 2008). To remain competitive, enterprises also need to be aware of what knowledge resources they already have and what sort of knowledge they need to gain to achieve their goals (Geisler & Wickramasinghe, 2009).

The significance of the attitude towards knowledge and the awareness of its importance comes from the fact that knowledge is a human characteristic and its management is basically performed in the course of social processes (Karwowski, 2010, p. 77). That is why one of the tasks of managers of today's enterprises should be developing employees' awareness of the common responsibility for the company's knowledge resource (Paliszkiewicz, 2007, p. 58).

Methodology

This article is based on a quantitative study conducted in Poland in years 2012 and 2013. The study was financed by Preludium 2 grant awarded to the author of this article by The National Science Center. The sampling frame for the survey was a business directory maintained by Kompass Poland. The survey questionnaire was developed in electronic and paper version. The electronic questionnaire was distributed through a surveying system developed by the author with the assistance of a computer scientist. This method helped to obtain a better response rate, thanks to a user-friendly questionnaire interface and well planned reminders sent only to those respondents who did not fill the questionnaire. The survey was conducted among companies from all industries but for purposes of analyses presented in this article only companies operating in the manufacturing industry were taken into account. A total of 1200 companies were surveyed, including 331 manufacturing firms. 80 percent of these companies were involved in the process of internationalization (Table 1).

Companies operating in foreign markets can be divided into groups depending on the form of their international operations. In the case of companies using several different forms, the most advanced form was taken into account. The order of forms of internationalization, from the least (top) to

Table 1 The Number of Manufacturing Enterprises in the Sample by Scale of Operations

Scale of operations	No.
Companies operating locally	66
Companies in the process of internationalization	265
Total	331

Table 2 The Number of Enterprises in the Sample by the Most Advanced Form of Foreign Activity

The most advanced form of the company's foreign activity	No.
Export or import	177
Subcontracting	49
Non-equity cooperation (licensing, franchising)	7
Equity cooperation (joint venture)	8
Foreign Direct Investment (FDI)	24
Total	265

Table 3 The Number of Enterprises in the Sample by Intensity of Foreign Activity

The intensity of the company's foreign activity	No.
Low (export, import, subcontracting)	226
High (non-equity cooperation, equity cooperation, foreign direct investment)	39
Total	265

the most (bottom) advanced is shown in Table 2. The table also shows the number of companies in the sample for which particular forms of foreign activity are most advanced. As can be seen, most of these companies are importers or exporters. A substantial number of companies use foreign direct investment and subcontracting. The least popular forms are non-equity and equity cooperation.

The forms of internationalization distinguished above were then assigned into two broad categories: low intensity of foreign operations – export, import and subcontracting – and high intensity of foreign operations – non-equity cooperation, equity cooperation and foreign direct investment. The number of companies classified into each category is shown in Table 3. The majority of companies – 85 percent – are characterized by low intensity of foreign activity.

As mentioned in the introduction, the goal of this article is to examine the role of the attitude to knowledge and innovation among manufacturing companies in creating their competitive advantage. In order to achieve this goal, the author created an AKI Index – Attitude to Knowledge and Innovation Index. It consists of four questions, formulated on the basis of the literature (Table 4). Answers to these questions were measured on a 5-point Likert scale, where 1 represents very low and 5 – very high. The purpose of the

Table 4 Questions on Which the AKI Index is Based

Key aspect covered by the question	Detailed question
Importance of knowledge development	From the point of view of our company's strategy, constant development of new knowledge is the most important part of our competition in the market
Identification of knowledge gaps	Our company regularly identifies its knowledge gaps and needs in terms of information and knowledge
Active use of company's knowledge resources	Information and knowledge gathered by our company is actively used in its everyday operations, especially when making decisions
Constant innovation, e.g., continuous development of new products or services	Our company constantly works on new products and/or services and organizational improvements

Notes Based on Darroch (2003, p. 47), Probst, Raub, and Romhardt (2004, p. 111), Pasher and Ronen (2011, p. 35, 36) and Wang, Hult, Ketchen, and Ahmed (2009, pp. 118–120).

questions was to examine prevailing attitudes to knowledge and innovation in a specific group of companies. Analyzing activities intended to increase companies' innovativeness or improve their knowledge management falls outside the scope of this article.

Competitiveness of enterprises in the sample was measured using a Competitiveness Index created by Fonfara (2009). It consists of four financial and non-financial measures. The reliability of this instrument has already been tested by many authors (Fonfara, 2009, 2012; Ratajczak-Mrozek, 2010; Soniewicki, 2015a).

In order to check the statistical significance of differences Mann-Whitney U test using SPSS statistical package has been used. It is a nonparametric alternative of *t*-Student test for two averages. It has been chosen due to the fact that analyzed variables did not meet the condition of normality.

Research Results

This section presents two main kinds of quantitative results. It starts with the findings concerning the attitude to knowledge and innovation in various types of manufacturing companies. The attitude was measured by the AKI Index and its component factors. The second part of this section is devoted to findings about the competitiveness of specific types of manufacturing companies depending on their levels of AKI Index.

Table 5 shows the intensity of the AKI Index and its component factors for companies operating locally and undergoing the process of internationalization.

According to Table 5, the value of the AKI Index is higher in companies undergoing internationalization than in companies operating locally. This

Table 5 The Intensity of AKI Index and Its Component Factors in Companies Operating Locally and Undergoing Internationalization

The question's key aspect	(1)	(2)	(3)	(4)
Importance of knowledge development	3.45	3.63	0.18	0.215
Identification of knowledge gaps	3.58	3.68	0.10	0.170
Active use of company's knowledge resource	3.79	3.84	0.05	0.511
Constant innovation, e.g., continuous development of new products or services	3.65	4.07	0.42***	< 0.001
Average (AKI Index)	3.62	3.80	0.19*	0.052

Notes Column headings are as follows: (1) operating only locally, (2) undergoing internationalization, (3) difference (2 – 1), (4) *p*-value (Mann Whitney test). * $p < 0.1$, *** $p < 0.01$.

Table 6 The Intensity of the AKI Index and Its Component Factors in Three Types of Companies: Operating Only Locally and With a Low and High Intensity of Foreign Activity

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(a)	3.45	3.58	0.13	0.388	3.90	0.44**	0.024
(b)	3.58	3.67	0.10	0.193	3.72	0.14	0.259
(c)	3.79	3.84	0.05	0.522	3.85	0.06	0.624
(d)	3.65	4.06	0.41***	0.001	4.15	0.50***	0.007
(e)	3.62	3.79	0.17*	0.076	3.90	0.29*	0.060

Notes Column headings are as follows: (1) the question's key aspect, (2) companies operating only locally, (3) companies with low intensity of foreign activity, (4) difference (3 – 2), (5) *p*-value (Mann Whitney test), (6) companies with high intensity of foreign activity, (7) difference (6 – 2), (8) *p*-value (Mann Whitney test). Row headings are as follows: (a) importance of knowledge development, (b) identification of knowledge gaps, (c) active use of company's knowledge resources, (d) constant innovation e.g. continuous development of new products or services, (e) average (AKI Index). * $p < 0.1$, ** $p < 0.5$, *** $p < 0.01$.

difference (0.19) is also statistically significant. Nevertheless, when looking at differences between particular AKI Index component factors, one can see that only in one case – 'constant innovation' – is the difference statistically significant. However, for each question, the values obtained are higher in companies undergoing internationalization than in those operating locally.

In Table 6, companies undergoing internationalization are divided into two groups – companies with a low intensity of foreign activity (export, import and subcontracting) and those with a high intensity of foreign activity (non-equity cooperation, equity cooperation, foreign direct investment). As can be seen, companies with a high intensity of foreign activity are characterized by higher values of the AKI Index than those with a low intensity of foreign activity.

Table 6 shows differences in values of the AKI Index and its component factors for companies operating locally and two types of companies

Table 7 Competitiveness of Enterprises Depending on Their AKI Index Value

(1)	(2)	(3)	(4)
≤ 3	2.62	–	–
> 3	3.21	0.59***	< 0.001
> 3.5	3.32	0.70***	< 0.001
> 4	3.51	0.89***	< 0.001
> 4.5	3.57	0.95***	< 0.001

Notes Column headings are as follows: (1) AKI Index value, (2) Competitiveness Index, (3) difference, (4) *p*-value (Mann Whitney test). *** $p < 0.01$

Table 8 Competitiveness of Companies Operating Locally and Undergoing Internationalization Depending on Their AKI Index Value – 1

(1)	(2)	(3)
≤ 3	2.63	2.62
> 3	2.99	3.26
Diff.	0.37	0.64***
p-value	0.123	< 0.001

Notes Column headings are as follows: (1) AKI Index value, (2) companies operating only locally, (3) companies undergoing internationalization. *** $p < 0.01$

undergoing internationalization. In the case of companies with a low intensity of foreign activity the differences are quite small. When it comes to companies with a high intensity of foreign activity, the differences are considerable, especially for two component factors – 'importance of knowledge development' and 'constant innovation.'

Table 7 shows the competitiveness of all manufacturing enterprises in the sample depending on their value of the AKI Index. Companies with the AKI Index > 3 are much more competitive. Moreover, the competitiveness of companies grows as the value of the AKI Index increases. All the results are highly significant.

Companies with the AKI Index below 3 are characterized by very low competitiveness (2.62). The value of Competitiveness Index below 3.0 means that a company is less competitive than its closest competitors. A company with Competitive Index higher than 3 can be considered as having competitive advantage.

The results shown in Table 7 indicate the importance of the attitude to knowledge and innovation in manufacturing companies. The differences are large and statistically significant. Nevertheless, it would be interesting to learn whether there are any differences in the importance of the component factors between companies operating only locally and those undergoing internationalization. Such a comparison is shown in Table 8.

According to Table 8, the level of competitiveness in companies with the AKI Index ≤ 3, regardless of their type, is very similar. When the AKI Index > 3, however, companies operating only locally are found to be much less competitive than companies undergoing internationalization with the same level of the AKI Index. According to the definition of the Competitiveness Index, the value of 3.0 means that a company's competitiveness is similar to its closest competitors (Competitiveness Index ranges from 1 to 5).

A different situation can be observed in companies undergoing interna-

Table 9 Competitiveness of Companies Operating Locally and Undergoing Internationalization Depending on Their AKI Index Value – 2

(1)	(2)	(3)	(4)	(5)	(6)	(7)
≤ 3	2.63	–	–	2.62	–	–
> 3	2.99	0.37	0.123	3.26	0.64***	< 0.001
> 3.5	3.11	0.48**	0.037	3.37	0.75***	< 0.001
> 4	3.06	0.44*	0.086	3.58	0.96***	< 0.001
> 4.5	3.08	0.46	0.144	3.67	1.04***	< 0.001

Notes Column headings are as follows: (1) AKI Index value, (2) companies operating only locally, (3) difference, (4) *p*-value (Mann Whitney test), (5) companies undergoing internationalization, (6) difference, (7) *p*-value (Mann Whitney test). * $p < 0.1$, ** $p < 0.5$, *** $p < 0.01$.

tionalization. There is a bigger difference in competitiveness between companies with a low (≤ 3) and high (> 3) value of the AKI Index in this group than between companies operating only locally. The value of the Competitiveness Index for companies undergoing internationalization with a high value of the AKI Index is 3.26. This means that such companies are, on average, more competitive than their closest competitors. This confirms the significance of the attitude to knowledge and innovation for companies undergoing internationalizations. Without the right attitude in this respect, such companies are much less likely to get ahead of their competitors.

The results presented in Table 8 are shown in more detail in Table 9.

Table 9 presents the level of competitiveness in two types of manufacturing companies depending on the value of the AKI Index. In the case of companies operating only locally, their competitiveness increases up to a certain level and then falls and increases again. The lack of statistical significance and an inconsistent pattern of values of the Competitiveness Index are probably due to the small number of such entities in the sample. Manufacturing companies with higher values of the Competitiveness Index tend to expand their operations and get involved in the process of internationalization, thereby moving to the other group. Nevertheless, the results show that in manufacturing companies operating locally an increase in the AKI Index leads to a rise in competitiveness, but only up to the level of 3.5 (AKI Index): above this value competitiveness of such companies does not improve.

In the case of the second group of enterprises (Table 9) – those undergoing internationalization – the situation is different. Competitiveness continues to grow with increasing values of the AKI Index. However, the magnitude of this growth differs. The biggest increase in competitiveness can be observed in the interval between ≤ 3 and > 3 of the AKI Index level. The growth is also substantial between in the interval between > 3.5 and 4.

So far, companies undergoing internationalization have been treated as

Table 10 Competitiveness of Two Types of Companies Undergoing Internationalization Depending on Their AKI Index Value

(1)	(2)	(3)	(4)	(5)	(6)	(7)
≤ 3	2.64	–	–	2.50	–	–
> 3	3.19	0.55***	< 0.001	3.69	1.19**	0.019
> 3.5	3.28	0.63***	< 0.001	3.89	1.39***	0.008
> 4	3.46	0.82***	< 0.001	4.05	1.55***	0.008
> 4.5	3.47	0.82***	< 0.001	4.22	1.72**	0.011

Notes Column headings are as follows: (1) AKI Index value, (2) companies with low intensity of foreign activity, (3) difference, (4) *p*-value (Mann Whitney test), (5) companies with high intensity of foreign activity, (6) difference, (7) *p*-value (Mann Whitney test). * $p < 0.1$, ** $p < 0.5$, *** $p < 0.01$.

one monolithic group, but, in fact, they are not. Companies that concentrate on exports differ in many respects from those engaged in Foreign Direct Investments (FDI). That is why in the following analysis two groups of companies undergoing internationalization are distinguished, depending on the intensity of foreign activity. According to Table 10, the competitiveness of companies undergoing internationalization with a low intensity of foreign activity rises with increasing values of the AKI Index. This trend is to be expected as companies with the AKI Index > 3 are more competitive than their closest competitors. However, the rise in competitiveness is much smaller in comparison with the second group: companies with a high intensity of foreign activity.

Companies with a high intensity of foreign activity and the AKI Index ≤ 3 are much less competitive than their closest competitors (Competitiveness Index: 2.50). Moreover, they are also less competitive than companies with the same value of the AKI Index and a low intensity of foreign activity (Competitiveness Index: 2.64). This indicates that the attitude to knowledge and innovation is crucial for creating competitive advantage by companies strongly engaged in foreign activities. Awareness of the role of these factors has a positive effect for such companies, while any deficiency in this respect interferes with the creation of their competitive advantage.

To conclude, the results show that attitudes to knowledge and innovation are especially important in companies undergoing internationalization and characterized by a high intensity of foreign activity. Without the awareness of the significance of these factors such companies are uncompetitive. On the other hand, any increase in this awareness contributes to improving their competitiveness.

Conclusion

The results of the questionnaire survey conducted among 331 manufacturing companies indicate that the value of the AKI Index is higher in com-

panies undergoing internationalization than in those operating locally. The difference is statistically significant. Furthermore, more detailed analyses of companies operating in foreign markets demonstrate that the importance of knowledge and innovation is also more appreciated in companies with a high intensity of foreign activities. When one considers individual factors making up the AKI Index, the biggest differences between the companies in the sample can be observed for the factors related to 'importance of knowledge development' and 'constant innovation.'

Another aspect analyzed in the article was the influence of the attitude to knowledge and innovation on the competitiveness of manufacturing companies. It has been found that this aspect is important for creating competitive advantage regardless of the type of enterprise, but is especially important for companies undergoing internationalization. However, the role of the attitude to knowledge and innovation on competiveness is not uniform across companies in this group. It is found to be the most important for companies with a high level of foreign activities. Their competitiveness consistently rises with increasing awareness of knowledge and innovation. Moreover, companies in this category which do not appreciate knowledge and innovation too much (AKI Index ≤ 3) are, on average, much less competitive than their competitors (Competitiveness Index: 2.50).

Limitations and Future Research

One needs to remember that the study described in this article concentrates only on the prevailing attitude to knowledge and innovation as revealed in the survey and does not examine particular actions undertaken by these companies in the area of knowledge and innovation. Nevertheless, as research results show, even the examination of attitudes can provide interesting insights. However, the study has certain implicit limitations. The most important one is that representatives of companies surveyed may consider target aspects important but actually not do much about them. Another limitation is connected with sample selection. The sampling frame for the survey was the business directory created by Kompass Poland. However, the database does not contain contact information for all manufacturing companies in Poland. In general, although the sample was quite large (331 entities), it did not contain many particular types of manufacturing firms, for example those producing high technology products.

Future research in this area should concentrate on understanding what sort of activities are undertaken by companies in the field of knowledge and innovation. This kind of studies could show what sort of actions are the most effective for manufacturing companies. This could be investigated not only through quantitative research but also through a qualitative study. The most interesting analyses are often based on both kinds of research. It must be emphasized that detailed analyses usually need to focus on

a particular industry because the company's profile tends to influence its actions in various respects. Moreover, studies in the area of knowledge and innovation should also be conducted among different kinds of companies, from other industries, for example service industry companies.

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Manageability of Technical Innovation through Technical Property Rights

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The term innovation is used in many respects and has been evolving over the last decades. This paper mainly focusses on managing technical innovation and differentiates this kind of innovation from others. For managing technical innovation, this work applies technical property rights, patents and utility models. The opportunity to protect the companies' technical knowledge legally is, apart from strategic measurements like trade secrecy, a very valuable tool to manage and commercialize innovation considering the shift from closed to rather open innovation. This paper discusses the applicability of legal protection measurements for the management of technical innovation containing a critical appraisal.

Keywords: innovation management, technical property rights, patent, utility model, technical innovation, open innovation, restrictions of technical protection rights

Introduction

The term innovation is commonly known and used in many respects, but widely differs in its content (Adams, Bessant, & Phelps, 2006, p. 22). Due to its etymological origin – lat. 'novus' (new), respectively 'innovatio' (renewal) – it seems to be clear that innovation is something which has not been existing, produced or processed in a particular way yet.

In the recent past, most authors attribute, in addition to novelty, a technological component to an innovation (Zahn & Weidler, 1995, p. 352f.; Trott, 2012, pp. 6, 15). This has changed in the past few years. Various authors demand a clear differentiation between innovation and a more technical related invention, whereas both are closely related to one another (Hauschildt & Salomo, 2011, p. 5ff.; Vahs & Brem, 2013, p. 20ff.; Pleschak & Sabisch, 1996, p. 6; Vahs & Burmester, 2002, p. 43f.; Roberts, 1987, p. 3).

Technical innovation in the context of this paper has to be understood as any innovation that is based on all fields of technology, such as engineering, chemistry, information technology or pharmacy.

This paper, based on existing and recent literature, advances the understanding of innovation management by simultaneously examining the term innovation and its determination criteria, technical property rights and their

substantial requirements, and the interdependencies between these two fields. More precisely, this theoretical research explores the benefits and restrictions of technical property rights for managing technical innovation. The paper introduces different criteria to determine whether innovation is apparent or not, followed by a pertinent description of types of measurements to manage technical innovation.

This paper, which builds on extant literature, discloses the lack of research regarding the restrictive applicability of technical property rights for managing innovation.

What Is Considered As Innovation?

To determine what can be considered an innovation, one can use the following criteria (Hauschildt & Salomo, 2011, p. 5; Corsten, Gössinger & Schneider, 2006, p. 10; Schmeisser & Solte, 2010, p. 27), which are briefly outlined below:

- Content-related dimension: What is new?
- Intensity of novelty: How new is it?
- Subjective assessment: New for whom?
- Process-oriented rating: Where does the novelty start and end?

This paper focusses on the management of the innovation process' result through technical property rights and the importance of knowing the requirements to obtain a technical property right during the innovation process.

Content-Related Dimension

Innovation can occur in several forms such as product, process, social, marketing or organizational innovation (Vahs & Brem, 2013, p. 52ff.; Corsten et al., 2006, p. 13f.; Vahs & Burmester, 2002, p. 72ff.; Trott, 2012, p. 16ff.; Pleschak & Sabisch, 1996, p. 14ff.). Zahn and Weidler (1995) subsume the different forms of innovation in three categories (p. 362ff.):

- Technical innovation: Products, processes, technical knowledge.
- Organizational innovation: Structure, culture, systems.
- Business innovation: Branches, markets, regulations.

Even though one can distinguish different forms of innovation, it is important to understand that the different types hardly ever occur separately. Usually, there exist interdependences between the different forms of innovation (Corsten et al. 2006, p. 13; Hauschildt & Salomo, 2011, p. 8; Schmeisser & Solte, 2010, p. 28). This paper focusses on the management of the technical innovation, which are mostly based on, or have a very close link to, invention.

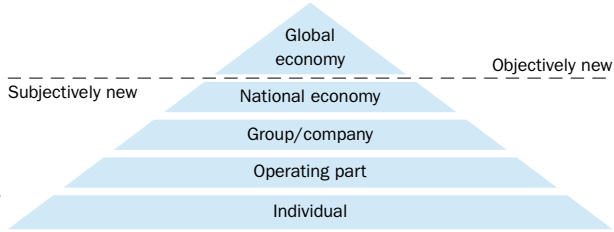

Figure 1

The Degrees of Novelty (adapted from Schröder, 1999, p. 990)

Intensity of Novelty

Additional to the differentiation regarding the form of appearance, one can also examine the degree of novelty. There exist various methods to evaluate the novelty of innovation. The spectrum reaches from dichotomous categories – very innovative vs. imperceptible innovative – to different gradual scales (for further information: Hauschildt & Salomo, 2011, p. 12ff.; Corsten et al., 2006, p. 15; Pleschak & Sabisch, 1996, p. 3f.). Each method uses the already existing technologies, state of the art and publicly available, codified knowledge as reference for the assessment of the scope of change. In academic literature, for example, one can often find the gradual distinction between basic innovation, improving innovation, adaption innovation, imitation and pseudo innovation. The first one leads to a radical change (e.g., a new technology such as wireless internet) whereas the latter one describes an incremental change (e.g., a new product design, with no new technological features). Thus, the impact of the innovation is decreasing from a basic to a pseudo innovation (Vahs & Brem, 2013, p. 64ff.; Corsten et al., 2006, p. 18; Pleschak & Sabisch, 1996, p. 4; Trott, 2012, p. 10).

Subjective Assessment

The assessment of qualitative changes within the range of novelty of innovation is subjective by nature. Hence, innovative is what is perceived as innovative. Considering this, it is significantly dependent on the subject, entity or state that assesses the innovativeness (Hauschildt & Salomo, 2011, p. 18ff.; Corsten et al., 2006, p. 16f.; Pleschak & Sabisch, 1996, p. 4; Schröder, 1999, p. 990).

From Figure 1, one can derive that there exist separate levels of novelty that constitute the concept of subjective assessment. A product or process that is perceived as new by an individual might not be perceived as new by a company due to the different knowledge base. The same is evident if one compares a national economy with the global economy. Thus, if something is globally new, one leaves the area of subjectivity and reaches an objective novelty.

Process-Oriented Rating

The last distinguishing characteristic observes the innovation process. There are several phase models to describe the process of innovation creation (Corsten et al., 2006, p. 32ff.; Vahs & Brem, 2013, p. 231; Schmeisser & Solte, 2010, p. 37). They differ in their level of abstraction and the emphasis on parts of the process. However, the existing innovation process models have three main phases, explicitly or implicitly, in common. First, the models include the *idea generation,* which is followed by the *idea acceptance* and finalized by the *idea realisation* (Corsten et al., 2006, p. 34ff.; Vahs & Burmester, 2002, p. 83ff.). It is evident that some models are more precise in their description of the beginning and ending of the process and the content of the single phases. Nevertheless, all models, in particular their inherent phases, which do not occur separately but rather are overlapping and interdependent, are idealistic approaches (Corsten et al., 2006, p. 35; Vahs & Brem, 2013, p. 231).

Legal Measurements to Manage Technical Innovation

After having a conceptual framework to approach the term innovation and differentiate technical from other types of innovation, the next step is the systematic elaboration of how to manage it. Thereby, the main focus is on technical innovation. The managing part includes the systematic economic planning, organization, provision and control (Hauschildt & Salomo, 2011, p. 29; Schmeisser & Solte, 2010, p. 111f.), as well as the realization of protection mechanisms (Corsten et al., 2006, p. 39) to achieve an overall successful implementation (Vahs & Brem, 2013, p. 28) and exploitation (Tiefel & Dirschka, 2007, p. 8). As mentioned above, innovation is based on, or closely linked to, invention. Considering this and the innovation process, it is obvious that every innovation has an intangible component (Vahs & Brem, 2013, p. 21). To protect and manage innovation and its underlying technical intangible component, one can use strategic and/or legal measurements (Brockhoff, 1994, p. 72; Gassmann & Bader, 2011, p. 5; Jennewein, 2005, p. 102; Burr, Stephan, Soppe, & Weisheit, 2007, p. 250ff.; Trott, 2012, p. 155ff.), whereas the emphasis in this paper is on the latter.

Strategic measurements are, for example, lead time advantages, trade secrecy, complementary resources, creation of strong distribution channels or constructive product protection against reverse engineering (for detailed information: Jennewein, 2005, p. 176ff.; Gassmann & Bader, 2011, p. 5). All strategic measurements, in particular trade secrecy, have an inherent risk in case of commercialisation (Trott, 2012, p. 157). By the time competitors are capable of imitating, maybe copying, due to a lack of secrecy in the value chain or reengineering, one has no direct leverage against these competitors. That constitutes a significant difference to legal measurements.

Legal measurements to manage innovation are industrial property rights (Burr et al., 2007, p. 3ff.; Gassmann & Bader, 2011, p. 5), which in general include *patents, utility models, industrial designs* and *trademarks* (Vahs & Brem, 2013, p. 439ff.; Götting, 2014, p. 4; Eisenmann & Jautz, 2007, p. 1). The former two are explicitly technology related whereas the latter two are not (Vahs & Brem, 2013, p. 442; Götting, 2014, p. 6f.). All industrial property rights enable an innovator to secure and successfully use their innovation and gain comparative advantages over their competitors. By nature, all *legal measurements are restricted to a certain territory,* which normally is a country or association of states. On this account, it is necessary to define the legal basis of argumentation. The following description is mainly based on the international Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS). Apart from TRIPS, this paper does also provide information about the US-American, European and German legal text. The TRIPS agreement admittedly underlies minimum standards regarding industrial property and other rights but also permits its more than 150 member states (Kraus, 2009, p. 61) freedom of interpretation, e.g., of the substantive patentability requirements (Straus & Klunker, 2007, para. 909; Lamping & Hilty, 2014, p. 14). Building on this, the following statements are generally valid. Derivative supplementary comments on territorial restricted specifications are highlighted as such.

All legal measurements are an inherent part of innovation management (Gassmann & Bader, 2011, p. 6). Due to the focus on technical innovation, the following section addresses, after a brief description of designs and trademarks, fundamental aspects of patents and utility models.

A design's purpose is the legal protection of a new or original independently created outward appearance of an article (TRIPS, 1994, Art. 25(1); Trott, 2012, p. 180f.), whereby a trademark's primarily function is the indication of origin and differentiation of a good or service (TRIPS, 1994, Art. 15(1); Vahs & Brem, 2013, p. 449ff.; Trott, 2012, p. 173ff.; Götting, 2014, p. 64ff.; Remmertz, 2009, p. 41).

Patents

Patents are exclusive rights in all fields of technology, which are essentially state granted, private law rights, which confer their owners to prohibit the 'making, using, offering for sale, selling, or importing' (TRIPS, 1994, Art. 28(1)(a)) where the subject matter of the patents are products. In case of a process, the patent owner may prohibit the usage of the process and the above mentioned acts for the product directly obtained by that process (TRIPS, 1994, Art. 28(1)(b)). However, the patent neither protects the product nor the process innovation itself. Instead, it protects the underlying invention, which is based on technical knowledge and manifests itself in the

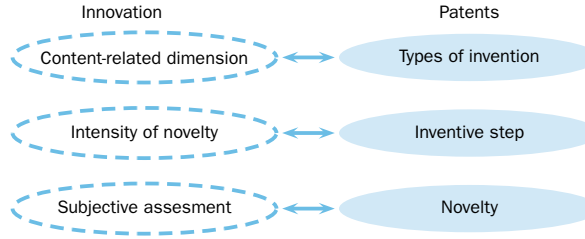

Figure 2
Mapping of Innovation Differentiation Criteria and Technical Property Rights Requirements

product or process (West, 2006, p. 111; Pretnar, 2009, p. 193f.; Pleschak & Sabisch, 1996, p. 48; Vahs & Brem, 2013, p. 442; Trott, 2012, p. 160; Götting, 2014, p. 29ff.). Simply put, a patent protects the immaterial core of an innovation.

The literature about innovation management, which considers technical property rights as a potential opportunity to protect and manage innovation, does not take into account that *not every technical innovation fulfils the requirements for a patent or utility model.* Some do not even mention utility models, because they are not expressly, but implicitly, mentioned in Art. 2(1) TRIPS (Gómez Segade, 2008, para. 136). It is rather a separate description of innovation and protection rights respectively (compare e.g., Trott, 2012; Pleschak & Sabisch, 1996; Vahs & Brem, 2013). To adequately apply technical property rights to the wide field of innovation, one has to cope with the relevant, territorially varying requirements. Thus, both protection rights and their requirements will be outlined in turn.

To obtain a patent for an invention in general, the invention has to be new, must involve an inventive step and needs to be capable of industrial application (Trips, 1994, Art. 27(1); Trott, 2012, p. 161; Kraßer, 2009, p. 119ff.; Gómez Segade, 2008, para. 135). These are the three substantive requirements for protection, whereas the industrial applicability is almost never an exclusion criteria (Kraßer, 2009, p. 189f.). On closer examination, the innovation criteria, except the process-oriented rating, and the substantive requirements reveal parallels, which allow the mapping of them as shown in Figure 2. Each mapped pair will consecutively be described.

The TRIPS agreement provides that patents can be granted for any inventions, whether products or processes, in all fields of technology (TRIPS, 1994, Art. 27(1)). This guideline is completely consistent with the European Patent Convention (EPC) and the German Patent Act (GPA) (Gruber & Zumbusch, 2012, para. 21.04ff.; EPC, 1973, Art. 52; GPA, 1980, § 9). The US Code Title 35 (2011) § 101 also includes product and process inventions but additionally mentions machines and compositions of matter. One important difference between the US Code and the other two legal texts is the lack of technical nature of inventions in the American Patent Law (Mayer &

Schlenk, 2012, p. 141). In the US, one uses the utility of inventions as a requirement for patent protection (Manual of Patent Examining Procedure, 2015, § 2107.01). Thus, the radius of protection through patents in the US is wider than in Europe (Laub, 2006, para. 634; US Code Title 35, 2011, § 100(a)). Comparing the content-related dimension of innovation with the geographical varying legislations, one may notice the similarity regarding the types of technical innovation and the types of protectable invention, namely products and processes.

The next pair that can be mapped is the intensity of novelty and the requirement of an inventive step. Both criteria are rather of qualitative nature (Kraßer, 2009, p. 304) and use the already existing as reference for the assessment of the scope of change. An invention bears an inventive step if it is not obvious to a person who possesses the knowledge of the state of the art (US Code Title 35, 2011, § 103; EPC, 1973, Art. 56; GPA, 1980, § 4) in the direct and peripheral field of the invention (Trott, 2012, p. 162; Götting, 2014, p. 141f.; Kraßer, 2009, p. 311; Gruber & Zumbusch, 2012, para. 14.26ff.). Consequently, the person skilled in the art is incumbent upon the evaluation of the invention. If one compares this requirement with the dichotomous categories or gradual scales of an innovation, one can assume that only radical or basic, improving and probably adaption innovation might be considered as being based on an inventive step, respectively.

Besides the inventive step, an invention has to be new but the novelty in terms of Patent Law and subjective assessment of an innovation are not congruent. TRIPS only stipulates novelty but leaves the final assessment to each territorial legislation. In European and German Patent Law, an invention is only new if it has not been available to the public in any way or anywhere before the date relevant for the priority of the patent application (EPC, 1973, Art. 54; GPA, 1980, § 3(1)). Hence, it is an objective (cf. Figure 1), formal and therefore absolute definition of novelty. In the US, the definition of novelty has been changed in the course of the American Invents Act (AIA) and is now almost equivalent to the European and German one (Münsterer, 2013, p. 270; US Code Title 35, 2011, § 102 (a)(1)). The only major difference is the still existing grace period of 12 month for an inventor (US Code Title 35, 2011, § 102(b)(1)). Using the three different legislations as reference to contrast the degree of novelty, which is inalienable for patent protection with the subjective assessment of novelty of innovation, it is clear that only a small portion of all innovation overcomes this hurdle.

Utility Models

The utility model is very similar to the patent but also shows some differences (Jennewein, 2005, p. 175). Like a patent, the utility model protects – generally speaking – an invention, which is new, involves an inven-

tive step and is industrially applicable (Gómez Segade, 2008, para. 135). The demanded requirements are overall less stringent than for a patent (Jennewein, 2005, p. 176). Due to the lack of European, let alone international, harmonisation, various countries interpret and apply the requirements differently (Gómez Segade, 2008, para. 135ff.). Some nations do not even have the utility model (Jennewein, 2005, p. 176; Gassmann & Bader, 2011, p. 14), but several, such as the majority of the 28 EU Member States (Gómez Segade, 2008, para. 138), Japan (Gassmann & Bader, 2011, p. 14), China, South Korea, South East Asia (e.g. Malaysia, Indonesia, Vietnam) and Latin America (e.g. Argentina, Brazil, Mexico) (Mak, 2014, p. 365f.) do offer utility model protection under various names, even though their legal systems vary widely. Commonly, utility models in all nations are cheaper, never require prior examination, which accelerates the granting, and their thresholds regarding novelty and the inventive step are usually lower.

This is contrasted by a shorter period of protection, weaker legal certainty (Gómez Segade, 2008, para. 135; Gassmann & Bader, 2011, p. 14), due to no prior examination and even more limited applicability (Jennewein, 2005, p. 176), e.g., no process protection in German Law (Kraßer, 2009, p. 187; Götting, 2014, p. 148). Nevertheless, it is an important protection right (Jennewein, 2005, p. 176), which has to be considered if it is available in the territory of choice.

After mapping most of the innovation criteria with the relevant requirements of technical protection rights, it is evident that not every underlying invention of an innovation can be protected by technical property rights. More precisely, patents and/or utility models can target a rather small fraction. At closer examination of the mapped pairs of innovation criteria and the substantial requirements (cf. Figure 2) of TRIPS for patents and the German legal text paradigmatic for utility models, one may directly recognize which kinds of innovation are protectable by patents or by utility models, respectively, as shown in Figure 3. Patents are only granted for technical products or processes, utility models merely for products. Depending on the method – dichotomous or gradual – one uses to determine the intensity of novelty, solely radical innovation or basic and improving innovation are patentable. The utility model again is designed more generously and even allows adaption innovation. Concerning the subjective assessment of novelty, only globally new technical innovations are eligible for patents. In contrast, utility models are to some extent restricted to a national novelty.

This interdisciplinary mapping simultaneously shows the lack of attention in literature to this topic and the necessity of a holistic approach due to the restrictive nature of technical property rights.

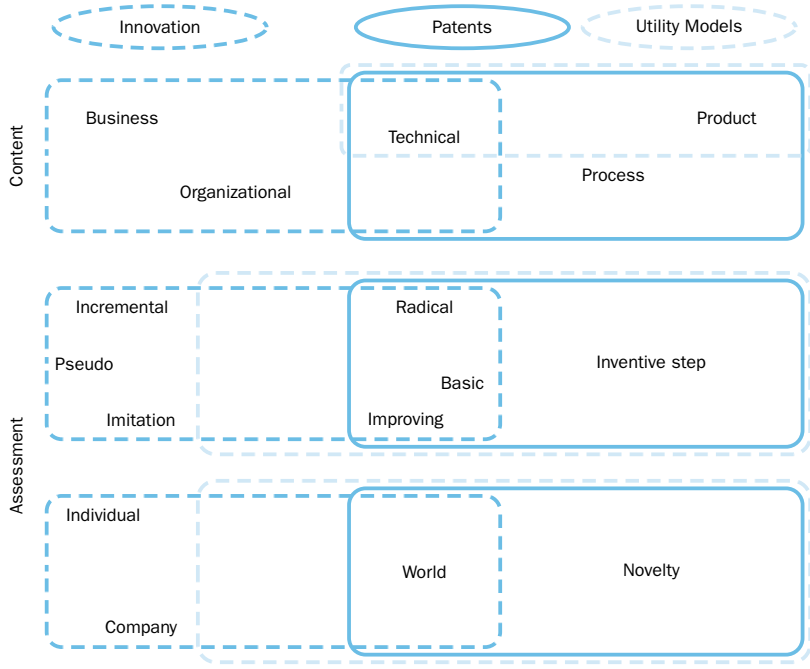

Figure 3 Protectability of Innovation through Technical Property Rights

Managerial Aspects of Technical Property Rights

By matching innovation criteria and legal requirements, it is getting clear that all protection rights focus on the output, the product or the process of the invention process, not the invention process itself (Götting, 2014, p. 50f.). That is why one cannot map the process-oriented innovation criteria with legal protection requirements. Nevertheless, it is very important to know where the process starts and ends to fulfil the requirements for patents or utility models. During the process, it is absolutely necessary to prevent the leaking of relevant information about the invention and the potential innovation to the public. Otherwise, it might not be possible to gain a technical property right. The management has to keep track of the flow of information, material and personal resources all along the innovation process, including the preceding invention process. This is inevitable to keep all options of protection and managing measurements available. The task of keeping track and control of the innovation process, including the restriction of information, material and personal resources to a certain enterprise or just a group of certain people, is getting more and more complex due to way the innovation process is evolving.

This implicates that the management not only has to assess its inno-

vation process but also the resulting innovation itself attentively (von Au, 2011, p. 21ff.). In case of a technical product or process, it is supposed to evaluate the substantial requirements of the technical property rights to see whether patent or utility model protection is feasible or not. If the innovation does not suit the requirements, other protection rights, e.g., designs or strategic measurements, might be possible to restrict the competitors' access to the innovation. If innovators are not aware of the appropriability of protection rights, they will be outperformed by their competitors more easily and will therefore be hindered to convert their technological success into a commercial one (Teece, 1986, p. 304; Tiefel, 2006, p. 6ff.).

The sole rely on first mover advantage, technological superiority or market infrastructure are just not contemporary anymore, in particular considering the way innovation is prospectively conducted.

From Closed to Rather Open Innovation

For several years, it has been common practice and is still a widespread mind-set for companies to generate, develop and commercialize their own ideas (Chesbrough, 2003, p. 36; Nestle, 2011, p. 60f.; Herzog, 2008, p. 19f.). This vertical integration model of a solely internal innovation process from idea generation to idea realization is known as closed innovation (Chesbrough, 2003, p. 36; Chesbrough, 2006, p. 1; Nestle, 2011, p. 60f.; Wagner, 2013, p. 8f.). In this model, the boundary of the firm is impermeable. Hence, only the proprietary technology base and research projects are considered in the innovation pipeline. During the process, some of the projects are stopped and not commercialized, whereas a few are chosen that go through to the market (Chesbrough, 2006, p. 2). Thus, all products and processes that cannot be commercialized over the existing distribution channels, as well as ideas or projects that require a specific technology, a lot of resources or do not fit the strategic orientation of the firm will either be set on the shelf or dropped (Nestle, 2011, p. 61; Chesbrough, 2006, p. 2). Due to the high upfront investment in internal research and development (R&D), it has become very important to protect the resulting intellectual property (Cleven, 2011, p. 10). In particular, patents are considered as a critical factor for success (Tiefel & Dirschka, 2007, p. 1; Ernst, 2002, p. 292f.). Companies that pursue the closed innovation approach consider an entirely internal and proprietary controlled innovation process from idea generation to the moment of sales, as a guarantee for high returns and innovation success (Wagner, 2013, p. 9). By reinvesting the profits, a new innovation cycle can be created (Cleven, 2011, p. 10). The closed innovation model worked well (Chesbrough, 2003, p. 37), but the competitive environment has changed (Wagner, 2013, p. 9).

Almost all industries are confronted with an increasing competitive pres-

sure. Shorter product life cycles, increasing cost of innovation, growing efficiency pressure and expectations from customers and stakeholders, pace and variety of scientific R&D, as well as higher numbers of competitors due to the globalization of economy, are some of the factors that indicate a higher competition (Mattes, 2010, p. 385; Tiefel & Dirschka, 2007, p. 1; Cleven, 2011, p. 8f.).

As a result of these changes, many companies rethink their way of innovation process (Mattes, 2010, p. 387; Ili, 2010, p. 28ff.; Gassmann & Reepmeyer, 2005, p. 240f.), and how innovation is conducted is changing according to the altered competitive conditions (Wagner, 2013, p. 9). Companies do not only rely on their internal R&D to generate ideas, inventions and launch innovation. Instead, they follow the approach that 'useful knowledge is widely distributed' (Chesbrough, 2006, p. 2) and that even very capable R&D firms are to some extent dependent on external knowledge sources (Cleven, 2011, p. 11; Wagner, 2013, p. 7). The inclusion of non-proprietary sources of knowledge and technology and the external use of proprietary knowledge, invention and innovation has been termed 'open innovation' (Chesbrough, 2006, p. 2f.; Wagner, 2013, p. 8ff.; Cleven, 2011, p. 11; Lichtenthaler, 2007, p. 22).

Open innovation describes a business model in which the firm boundaries are, opposing to closed innovation, permeable for in- and outflows of ideas, knowledge and technology throughout the entire innovation process, from idea generation to idea realization, to accelerate it (Chesbrough, 2006, p. 1; Poot, Faems, & Vanhaverbeke, 2009, p. 3). As a consequence of the permeability of firms' boundaries, even innovation that would have been dropped or set on the shelf in a closed innovation process can be taken to market through external channels (Chesbrough, 2006, p. 8; Chesbrough, 2003, p. 37; Lichtenthaler, 2007, p. 22; Cleven, 2011, p. 11). Regarding the inflow into the company, several sources have been identified in literature (von Hippel, 1988, p. 3ff.; Chesbrough, 2006, p. 6; Cleven, 2011, p. 13ff.; Herzog, 2008, p. 24): suppliers and customers, universities and government, independent experts, and competitors.

For the successful integration of the external influx, companies have to provide an organizational environment, such as research capabilities and adaptability (Chesbrough, 2006, p. 6f.; Herzog, 2008, p. 28ff.; Cleven, 2011, p. 22ff.; Wagner, 2013, p. 8; Adams et al., 2006, p. 29). Further, the inflow must match the proprietary requirements and fit to the business model (Hossain, 2012, p. 755f.). In addition, the company has to cope with the acceptance of external input like the 'not-invented-here' (NIH) syndrome (Nestle, 2011, p. 62ff.; Ili & Albers, 2010, p. 46ff.; Chesbrough, 2006, p. 6).

In addition, the outflow of knowledge, technology or inventions is an

endeavour that has to be well thought out, controlled and conducted with caution (Lichtenthaler, 2005, p. 231ff.; Gassmann & Bader, 2011, p. 243; Nestle, 2011, p. 68ff.; Lichtenthaler, 2007, p. 23). Potential opportunities to transpire proprietary knowledge, technology or inventions are licensing, ventures, spin-offs (Lichtenthaler, 2007, p. 22f.; Chesbrough, 2006, pp. 3, 9; Herzog, 2008, p. 21), alliances (Gassmann & Bader, 2011, p. 245f.; Chesbrough, 2006, p. 7; Nestle, 2011, p. 68f.; Lichtenthaler, 2005, p. 233ff.) and intermediate markets (Chesbrough, 2006, p. 7; Hossain, 2012, p. 761; Herzog, 2008, pp. 25, 39ff.).

The way of conducting innovation with a certain openness and permeability of a firm's boundaries has advanced to be a new paradigm (Chesbrough, 2006, p. 2), whereas there are critical and dissenting views (Trott & Hartmann, 2009; Dahlander & Gann, 2010). Overall, there is empirical evidence that applying open innovation has a positive, not negligible impact on the innovation performance (Poot et al., p. 5; Cleven, 2011, p. 69; Wagner, 2013, p. 8), which results in an increasing proactive external commercialization of all proprietary knowledge (Lichtenthaler, 2005, p. 231f.).

Meaning of Technical Property Rights for Open Innovation

The outflow in the open innovation approach requires careful consideration and contains the risk of disclosing relevant aspects to potential partners, who then get access at almost zero marginal cost (Lichtenthaler, 2005, p. 235; West, 2006, p. 116; Cleven, 2011, p. 69; Straus & Klunker, 2007, para. 923). Nevertheless, the disclosure is to some extent necessary, because without providing insights into the offered information, it is hardly possible to evaluate it (Dahlander & Gann, 2010, p. 704; Wurzer & Frey, 2009, p. 363; West, 2006, p. 116).

To *reduce the risk of disclosing knowledge, technology and invention, one can use utility models and patents,* because they enable the evaluation of the assets without their leak due to the exclusive nature, which these protection rights confer (Wurzer & Frey, 2009, p. 363; Lichtenthaler, 2007, p. 24; West, 2006, p. 116). The strength of exclusivity is dependent on the quality of the utility model or patent, respectively (Lichtenthaler, 2007, p. 28). The stronger the patent the more difficult it is to invent around it. The same applies for utility models. In general, intellectual property rights, and thus utility models and patents, are considered critical elements. Some authors even view them as requirement (West, 2006, p. 109; Dahlander & Gann, 2010, p. 704) for the external exploitation of knowledge, technology and invention (Chesbrough, 2006, p. 10; Lichtenthaler, 2007, p. 27; Lichtenthaler, 2005, p. 235; Wurzer & Frey, 2009, p. 367f.; Herzog, 2008, p. 40).

Thus, both utility models and patents are an important component for the

exploitation within open innovation. As already stated, the two considered protection rights do not cover everything that is subsumed under technical innovation. They protect the applicatory knowledge inside the innovation (Pretnar, 2009, p. 193), which is new, capable of industrial application and involve an inventive step.

During the closed innovation era, technical protection rights have primarily been used for protecting the freedom to operate for internal R&D preventing the loss of intellectual property and avoiding costly litigation (Chesbrough, 2006, pp. 4, 10; Lichtenthaler, 2007, p. 22; Herzog, 2008, p. 19f.). Over time, the understanding of innovation changed towards an increased interaction with a firm's environment. Merely the acquisition of external knowledge, technology and invention has been conducted and may nowadays be regarded as standard behaviour (Gassmann, 2006, p. 223f.; Lichtenthaler, 2007, p. 22; Poo et al., p. 5). Gradually, it could be observed that companies started to open their organizational boundaries even further and actively commercialized their technological knowledge externally (Lichtenthaler, 2005, p. 231; Herzog, 2008, p. 40f.; Dahlander & Gann, 2010, p. 704). Technical property rights, in particular patents, are an important tool to capture value from these invention, technology and knowledge transactions (Lichtenthaler, 2007, pp. 27f., 35, 37f.; Gassmann, Enkel, & Chesbrough, 2010, p. 219; Tiefel & Dirschka, 2007, pp. 1f., 12; Pretnar, 2009, p. 193; Wurzer & Frey, 2009, p. 368f.; Gassmann, 2006, p. 225). Patents even bear a dominant position within the protection measurements (Ernst, 2002, p. 318f.; Jennewein, 2005, p. 185; Anand & Galetovic, 2004, p. 73).

Comprehensively, the importance and scope of duties of technical property rights will be briefly summarized in turn for closed and open innovation, respectively. In a closed innovation approach, utility models and patents are merely used for internal R&D protection, prevention of litigation and applicable knowledge leak and are not a source of revenue or capturing value. The entire innovation process is conducted by one single company. Thus, technology is invented, protected, developed, brought to market and distributed internally. The exploitation is restricted to the internal business model. As a matter of prioritizing, several good ideas and inventions are set on the shelf without ever performing.

In contrast, in an open innovation approach technical property rights are not only used for protection and prevention. They additionally can be understood as assets (Laurie & Sterne, 2009, p. 455f.; Gassmann, 2006, p. 225) with several functions (Reinhardt, 2009, p. 234ff.; Gassmann & Bader, 2011, p. 241ff.; Jennewein, 2005, p. 166ff.; Burr et al., 2007, p. 36ff.), which can and are supposed to be managed through an adequate business model. These functions include, among others, the exchange, transfer, licensing and sale of invention with its underlying technical knowledge or

technology. Through openness to external collaborators, e.g., customers, suppliers, universities or competitors, business models and the use of internal and external R&D and inventions, one can capture value, maybe even create a reliable source of revenue (Lichtenthaler, 2007, p. 27f.; Ernst, 2002, p. 293f.). A precondition to manage, transfer and commercialize innovation, invention and technology in an open environment is the proprietary protection or the approval or license of the original owner (Graham & Mowery, 2006, p. 184f.; West, 2006, pp. 115, 129).

Restrictions of Technical Property Rights

Overall, technical property rights are, because of their functionality, very valuable for fulfilling the managerial tasks, in particular in terms of controlling, protecting and exploiting innovation in a wider sense (Hundertmark, 2009, p. 150ff.; Burr et al., 2007, pp. 36ff., 89; Gassmann & Bader, 2011, p. 241ff.; Omland, 2005, p. 402f.). After describing the term innovation and its scope and subsequently matching it with the substantive requirements for patents and utility models, it becomes apparent that not every technical innovation can be protected by technical property rights (Jennewein, 2005, p. 164). Only the applicable and codified technical knowledge, which manifests in form of a product or process invention and presents a world novelty, involves an inventive step and is industrially applicable, can be protected by patents (Adams et al., 2006, p. 29f.; Fabrizio, 2006, pp. 138, 160). For the utility model, it is even more restrictive. Due to the lack of international minimum standards, there are various differences from one country to another. In Germany, for instance, only products, not processes or biotechnology in general, can be protected by utility models. However, it has a lower demand on the novelty than the patent, offers a grace period of six months (German Utility Model Act, 1986, § 3(1)) and is a lot cheaper (Appendix of German Patent Cost Act 2). In contrast, the Austrian utility model provides protection for all kinds of invention that can be patented, processes included. One difference is the threshold regarding the inventive step, which is lower for utility models than for patents (Gassmann & Bader, 2011, p. 14).

This again reflects the territoriality of technical property rights and intellectual property rights in general. Companies have to keep this territorial restriction in mind, in case they open their innovation process, because open innovation does not have any territorial restrictions (Straus & Klunker, 2007, para. 916f., 925; Jennewein, 2005, p. 189f.). In addition to the territorial restrictions, the effectiveness of technical property rights is dependent on several aspects, primarily the quality (Lichtenthaler, 2007, pp. 35, 37; Ernst, 2002, p. 304), but also other aspects like the life cycle of technology (Ernst, 2002, p. 301f.; Hundertmark, 2009, p. 144f.; Jennewein, 2005, p. 181) or the branch (Lichtenthaler, 2007, p. 27; Teece,

1986, p. 287; Jennewein, 2005, p. 165f.; Ernst, 2002, p. 302; Gassmann & Bader, 2011, p. 163ff.). Competition law may also limit the effectiveness of technical property rights in case of a discriminating or abusive use of them (Kraus, 2009, p. 66; Burr et al., 2007, p. 13; Lamping, 2014, p. 10; Frost, 1964, p. 49ff.).

Depending on the technical object of reflection, there sometimes exist more appropriate ways of protection than technical property rights (Jennewein, 2005, p. 184; Gassmann & Bader, 2011, p. 22). In such cases, one has to evaluate other means of protection to be still capable of preventing the unintended access from third parties. These measurements may either be other industrial property rights or even strategic measurements (Teece, 1986, p. 287ff.; Pretnar, 2009, p. 199f.; Jennewein, 2005, p. 185).

Conclusion

This paper has shown that managing technical innovation is a complex, interdisciplinary task, which requires more than just knowledge about technical property rights. Both the development of what is considered as innovation and which kind of technical property rights exist have been described separately. The term innovation itself has a very wide scope. To distinguish different types of innovation, one uses mainly four criteria. These criteria show similarities to the substantive requirements of technical property rights, which allows the mapping of them. One main result is the fact that not every technical innovation can be protected legally. It is rather a small fraction of innovation, considering the broad term and the differentiation criteria of innovation, which can be placed under the protective shield of utility models and patents.

Nevertheless, technical property rights as part of the wider field of intellectual property rights are an inalienable necessity for the external commercialization without a leak of the underlying knowledge, technology or invention of a technical innovation. They provide and improve the conditions for capturing value, help to control the utilization and, therefore, provide the freedom of choice about the exploitation of technical innovation and its underlying invention. The benefits of technical property rights are restricted. The major limits of patents and utility models for innovation protection are territoriality, the allowed types of innovation, as well as the requirement regarding the inventive step and novelty.

These restrictions determine that a profound approach for protecting and managing technical innovation needs to be holistic, contain legal and strategic measurements, and needs to be individually adjusted for the considered type of innovation (Ernst, 2002, p. 318f.; Jennewein, 2005, p. 183ff.). Therefore, technical property rights are merely one, but very im-

portant, piece of the puzzle for a successful management (Sailer, 2009, p. 158f.) and commercialization (Wurzer & Frey, 2009, p. 367f.) of technical innovation considering a shift from closed to rather open innovation. Therefore, by building upon the results of this paper, the value of the presented theoretical approach can be improved by future empirical studies that support and/or refine the outcomes regarding the appropriability of technical property rights in the evolving innovation process.

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Assessing Perceived Knowledge Creation: The Role of Organizational Knowledge and Market Environment

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The purpose of this research is to investigate the impact of organizational knowledge factors and market knowledge factors on knowledge creation among Thai innovative companies. 464 questionnaires were distributed to Thai innovative companies registered under the National Innovation Agency (NIA) and 217 were returned. Structural Equation Modelling (SEM) is used to determine the effect of two sets of knowledge creation sources: organizational knowledge (social interaction, organizational routines and information system) and market knowledge (customer orientation, competitor orientation and supplier orientation) on knowledge creation (product and service outcome, process outcome and market outcome). The results indicated that the integration of organizational knowledge and market knowledge is the main driver of knowledge creation. Furthermore, the findings suggest that social interaction and customer orientation are the most significant predictors of knowledge creation. This study provides an empirical analysis on the importance of different sources of knowledge in the knowledge creation process in SMEs and its impact on companies' innovative knowledge outcomes.

Keywords: organizational knowledge, market knowledge, knowledge creation, National Innovation Agency (NIA)

Introduction

Innovation is as an instrument for seeking interest and opportunity from various changes to create different business and services from competitors (Drucker, 1985). Innovation is a result of knowledge acquisition, sharing and assimilation through knowledge creation. It is extremely dependent on the availability of knowledge and its complexity created by the explosion of richness and reach of knowledge has to be identified and managed to en-

sure successful innovation (Adams & Lamont, 2003). Therefore, knowledge becomes a key for successful innovative output. According to Saarenketo, Puumalainen, Kuivalainen and Kylaheiko (2009), organizational knowledge and market knowledge become sources of knowledge creation for organization's growth.

According to Nonaka (1994), innovative knowledge can be created through integration between organizational knowledge and market orientation. However, a researcher found that previous studies (Lopez-Nicolas & Soto-Acosta, 2010) are still incomprehensive. They are lacking of studies on integration of both internal and external sources of knowledge creation in a comprehensive view. This makes even more attractive for the purpose of study, since studies conducted are very rare in this field, especially among Thai innovative companies. The focus of this study is on innovative companies located in Thailand. More specifically, the aim of this study is to further the understanding of what factors and their relationship influence the process of knowledge creation.

Literature Review

Overview of Knowledge Creation

Knowledge creation is an integration process through which an organization interacts with individuals and the environment. This interaction makes the knowledge process occur as a dynamic and inter-linked interaction from an individual-to-societal level (Nonaka & Toyama, 2003). The knowledge-based innovation literature explains the role of knowledge in the process of innovation (Quintance, Casselman, Reiche, & Nylund, 2011). Several models of a knowledge-based process of innovation can be found in the literature (Galunic & Rodan, 1998). These models explore the characteristics of knowledge and their impact on the knowledge creation process whose output is implicitly viewed as an innovation. For example, Tsai and Ghoshal (1998) and Tsai (2001) present models of organizational innovativeness that draw a parallel between knowledge creation and innovation. These models highlight the role of various processes of knowledge creation and recombination for the generation of new knowledge that can be considered an innovation. The recombination for the generation of new knowledge is called knowledge integration (Quintance et al., 2011).

Knowledge integration can be categorized into internal integration and external integration. Internal integration focuses on rich coordination, communications and cooperation among team members (Olson, Walker, Ruekert, & Bonner, 2001). Internal integration is mainly related to a firm's ability to collect together and take advantage of all information and knowledge sources available inside the firm (Paolo, 2007) and to reduce the gaps between the thought worlds typical of each functional area (Dougherty, 1992).

In fact, the increase in internal integration helps team members to capture innovative business and market analysis, technical development problems, product testing, and product commercialization (Swink & Song, 2007).

External integration is a strategic approach of the firm aimed at key boundary-spanning initiatives for fostering high-level coordination and communication between a firm, its customers, competitors and suppliers to effectively support product design and development activities (Dröge, Jayaram, & Vickery, 2004). More than ever companies are experiencing the need to develop new products more rapidly to satisfy expanding and changing customer requirements considering new technologies and strengthening global competition (Millson & Wilemon, 2002). Increasing the information and knowledge available at the beginning of the development process is beneficial to reduce market and technological uncertainties, and to boost the possibility of new product success. External integration is related to the ability to gain further information and knowledge by involving external entities in the product development process through network relationships (Paolo, 2007). A firm can enforce and increase the external integration of its process by collecting the information and knowledge needed to achieve substantial reductions in uncertainty during development from well-informed external entities.

The study conducted by Lin and Chen (2008) shows that internal integration and external integration positively influence knowledge creation for the firm innovation. Therefore, we argue that new knowledge creation is created through an integrated process between organizational knowledge and market knowledge.

Assessing Knowledge Creation (KC)

There are not many literatures discussing the dimensions of knowledge creation. Most of the literatures discussed knowledge creation in the form of its tacitness and explicitness. However, some authors have emphasized different dimensions of knowledge creation. Schumpeter (1934) suggested knowledge creation is translated namely into new products and services, new methods of production, and new markets. Miller and Friesen (1983) focused on four dimensions: new products and services, new methods of production, risk taking by key executives and seeking solution. Meanwhile, Capon, Farley, Hulbert, and Lehmann (1992) suggested three dimensions: market, strategic tendency to pioneer and technological advancement. Wang and Ahmed (2004) suggested four dimensions of knowledge creation: products and services, process, market and strategy.

From the above discussion we can conclude that there are four main dimensions to measure knowledge creation, product and service outcome, process outcome, market outcome and strategy outcome. However, this

study excludes strategy dimension because the majority of empirical research does not consider strategy outcome as a component factor of organizational innovativeness (Wang & Ahmed, 2004).

Product Outcome (PO)

Knowledge creation is crucial to new product and service outcome (Yang, 2007). Knowledge creation in products and services allows companies to establish a dominant position in the competitive marketplace, and afford new entrants an opportunity to gain a foothold in the market (Danneels & Kleinschmidt, 2001).

Products developed from new knowledge are most often referred to as perceived newness, novelty, originality or uniqueness of products (Henard & Szymanski, 2001). New product development is dependent on the organization's ability to apply knowledge and information towards the discovery of new products and services (Tannenbaum & Nash, 2002). The new product development and knowledge management processes are of utmost importance, since products that do not adapt to changes in the market knowledge cease to exist (Goldenberg, Lehmann, & Mazursky, 2001). Madhavan and Grover (1998) stated that the central theme for the new product and service development process is the creation of new knowledge.

Process Outcome (PRO)

The discovery of new knowledge can lead to process innovativeness, which captures the introduction of new production methods, new management approaches, and new technology that can be used to improve production and management process (Wang & Ahmed, 2004). Process innovativeness work is mainly driven by the needs of production and can be said to be primarily efficiency-driven (Bergfors & Larsson, 2009). As a result, an organization can exploit their resources and recombine its resources for optimizing the competitive advantage in production. Besides the implementation of new approach, process innovativeness can also lead to the reduction of production costs, higher production yields, improvement of production volumes, product recoveries and environment-friendly production (Larger, 2002).

Market Outcome (MO)

Market outcome refers to the discovery of a new market segment, which is related to market research, advertising and promotion (Andrews & Smith, 1996). The main reasons for a company to enter a new market segment or focus on a particular group of customers are to identify new market opportunities and fulfill a market gap by monitoring market trends. For some companies, this means that they can enter a market or identify a new market

segment and launch products with cutting-edge technological content. Entering a new market segment will increase the company's competitiveness through growth possibilities, value creation and perceived value, profits, increased sales, prices and market shares, better protection from competition, customer retention/loyalty and higher purchase frequency (Toften & Hammervoll, 2013).

Conceptual Framework

Organizational Knowledge (OK)

Organizational knowledge has become an important factor for knowledge creation (Park, Ribiere, & Schulte, 2004) and the most valuable strategic resource for the organization (Takeuchi & Nonaka, 2004). Organizational knowledge refers to the capability of the members the organization has developed to draw distinctions in the process of carrying out their work by enacting sets of generalizations based on collective understandings and experiences (Tsoukas & Vladimirou, 2001). It resides within an organization and can be either in tacit or explicit form.

Organizational knowledge creation has become a new trend of knowledge management study. The internal created knowledge can develop new skills, ideas and uniqueness, which is difficult for competitors to imitate (Nonaka, von Krogh, & Voelpel, 2006). Nonaka (1994) pointed out that if the organization can arrange the process of knowledge creation effectively through sharing knowledge, which is dispersed and embedded in individuals, equipment and routines, it would be a set of successful knowledge management activities to achieve knowledge creation. Hedlund and Nonaka (2008) highlight that creating and exploiting knowledge within an organization revolves around the integration of tacit and explicit knowledge, and the transfer and transformation of knowledge between organizational knowledge and market knowledge. Thus, the creation of new knowledge is essential for the success of the organization to compete in dynamic environments. According to previous studies by several researchers, organizational knowledge can be created through social interaction within an organization (Tsoukas & Vladimirou, 2001), organizational routines (Takeuchi & Nonaka, 2004; Nonaka & Toyama, 2003) and information technology (Nonaka, Toyoma, & Konno, 2000).

Organizational knowledge represents the core element of innovative organization (Inkpen & Tsang, 2005). Innovation generation demands that knowledge is continually renewed and replenished (Brown & Eisenhadrt, 1997). The existing organizational knowledge will become an obsolete knowledge and will be replaced by new and integrated one (Takeuchi & Nonaka, 2004). New integrated knowledge is developed through a synthesizing process in which existing organizational knowledge interacts with mar-

ket knowledge (Nonaka & Toyama, 2003). An organization absorbs market knowledge, combines them with pre-existing knowledge, and creates new one (Cohen & Levinthal, 1990). Therefore, we argue that organizational knowledge is influenced by market knowledge.

H1 *Organizational knowledge is positively influenced by market knowledge.*

Social Interaction (SI)

Social relation ties constitute information channels that reduce the amount of time and investment required to gather information (Chua, 2002). The role of network on social relationship was recognized as a critical mechanism for knowledge combination and exchange to further achieve favourable innovation (Nahapiet & Ghoshal, 1998). There are three dimensions related to social interaction among organization members, which include structural, relational and cognitive dimensions (Nahapiet & Ghoshal, 1998).

The structural dimension concerns the properties of the social system and it refers to impersonal configuration of linkages between people of units (Chua, 2002). The structural dimension helps organization members to access desired strategic resources and increases their social interaction through physical means or electronic means (Chua, 2002) in order to be involved in knowledge creation activities (Bell & Jackson, 2001). The relational dimension is the kind of personal relationships. Organization members developed social interaction through the norms of cooperation care and the sense of identification care (Von Krogh, Ichijo, & Nonaka, 2000). Care gives rise to mutual trust, active empathy, access to help and lenient judgment (Von Krogh et al., 2000). Lastly, the cognitive dimension refers to those resources that provide shared representations, interpretations and system of meaning. In the cognitive dimension, organization members discuss and exchange information, ask questions and provide opinion (Nahapiet & Ghoshal, 1998). The cognitive dimension also influences a perception and it also provides a frame of reference for observing and interpreting the environment. Therefore, it facilitates the combination of diversified knowledge mostly in the form of tacit knowledge.

Organizational Routines (OR)

Organizational routines serve as a frame of reference for 'appropriate behaviour' for the members of an organization (Hoeve & Nieuwenhuis, 2006). Organizational routines refer to explicit structure that includes implicit actions as well. Galunic and Rodan (1998) referred to them as tacitly-held and explicitly-held routines to address the fact that routines can be in tacit form and explicit form. An organization needs those routines to be a guideline for

effective work and good quality output. Employees will refer to these organizational routines in completing their tasks and jobs. A study conducted by Tsoukas and Vladimirou (2001) showed that routines in the form of written procedures and manuals makes employees perform their tasks efficiently and effectively. Correspondingly, routines can be seen as part of a learning process leading to continuously improving capabilities (Andreu & Ciborra, 1996). Therefore, routines can be both operational working procedures (explicitly-held-routines) and organizational practices (tacitly-held routines).

Information System (IS)

The delevolpment of sophisticated corporate information systems makes an organization retrieve the needed information very quickly and on time. Information systems become one of the critical factors of success in implementing knowledge management (Hasnali, 2002). A study shows that an information system has a significant positive influence on the process of knowledge creation (Lopez-Nicolas & Soto-Acosta, 2010). This study, in small innovative hi-tech companies, showed that the use of information system (IS) assisted in creating new knowledge (Spraggon & Bodolica, 2008). IS represents a valuable tool where individual, group and organizational knowledge are continuously codified, stored, diffused and renewed. It also represents a significant source of organizational learning and knowledge creation. Accordingly, the following hypotheses are proposed.

H2 *Organizational knowledge positively influences knowledge creation.*

H2a *Social interaction positively influences knowledge creation.*

H2b *Organizational routines positively influence knowledge creation.*

H2c *Information system positively influences knowledge creation.*

Market Knowledge (MK)

Market knowledge is not explicit but rather difficult to codify and communicate (Nonaka & Takeuchi, 1995). The prior research shows that the acquisition of market environment leads to short-term improvements in sales and profitability growth, market share, new product success, customer satisfaction and return on assets (Jaworski & Kohli, 1993; Slater & Narver, 1999). According to a knowledge-based view of the firm, external knowledge acquisition from market knowledge becomes one of the critical means for knowledge creation in order to achieve competitive advantage (Nonaka & Teakeuchi, 1995; Lavie, 2006). Organizations can acquire information and knowledge from their interactions with a variety of external stakeholders (Ayuso, Rodriguez, Garcia-Castro, & Arino, 2011).

According to the stakeholder theory (Freeman, 1984), stakeholders refer to groups and individuals who can affect or are affected by the organiza-

tion's purpose, which include customers, competitors, suppliers, government, NGOs and communities (Holmes & Smart, 2009). Stakeholders become important players in market knowledge. They are divided into primary and secondary stakeholders. The primary stakeholders are those who are directly involved in a market relationship such as customers, competitors and suppliers. On the other hand, secondary stakeholders, government, NGOs, communities and others, refer to those who are not directly involved in a market relationship (Ayuso et al., 2011). The scope of this study only covers the role of primary stakeholders.

Customer Orientation (CO)

The voice of the customer is deployed throughout the product planning and design stages (Hauser & Clausing, 1988). It will become an input in the product design and development. Customers should be the driving force behind product development. A firm that commits itself to superior customer service and integrates customer preferences and needs into its product development strategy has the best guarantee for long-term success (Gatignon & Xuereb, 1997). Any changes in customers' demands may negatively affect the value of current marketing capabilities.

The literature suggests that the primary objective of an organization is to deliver superior customer value, which is based on knowledge gathered from customer analyses and disseminated throughout the organization (Narver & Slater, 1990). The understanding of customer needs, preferences and market trends enables the organization to identify and develop capabilities for long term performance (Day, 1994), because the organization has information on customers' implicit needs to fulfil their customers' satisfaction.

Competitor Orientation (ComO)

Competitors are defined as organizations or firms offering products or services that are close substitutes, in the sense that they serve the same customer need (Kotler, 2000). Competitors' orientations would provide a solid basis of information pertaining to present and potential competitors for executive actions. It can also enhance a firm's competitive advantage by allowing it to benchmark with, learn from, imitate, and improve the products of successful competitors (Drew, 1997). A considerable body of marketing thought suggests that competitor orientations should improve an organization's performance by enabling the organization to position its strengths against rivals' weaknesses (Slater & Narver, 1999).

Competitors' orientations can be accessed from many sources and they are available in many forms. The more traditional forms of competitors' orientations are based on the assessment of competitors' goal, financial

results, successes and failures, as well as competitors' assumption about a market (Porter, 1980). Besides the traditional forms, an organization can access and analyze competitors through internal employees and sale personnel. They can be a medium of supplying competitors' movements and activities in a market because they are directly involved with substitute products or services. Thus, sufficient information on competitors will guide an organization to take appropriate actions in encountering any strategies or actions implemented by any rivals, which could threaten its business operation (Sørensen, 2009).

Supplier Orientation (SO)

Supplier orientation refers to a supplier who has a clear understanding of the manufacturer's needs and expectations (Gwinner, Bitner, Brown, & Kumar, 2005). To remain competitive in their mainstream markets, an organization must establish a cooperative relationship with suppliers in order to reduce transaction costs associated with 'buy' decision (Verbeke & Tung, 2013; Sudharatna, 2010). The cost of materials and services has become an affecting factor for an organization's cost. If an organization can reduce the cost of input, it will have a competitive advantage over its competitors in terms of cost leadership. Besides the cost of materials and services, the quality of materials supplied should also be taken into consideration for producing quality products (Sudharatna, 2010).

Environmental dynamism may cause obsolescence in an organization's current knowledge base and erode its competitive advantage (O'Reilly & Tushman, 2008). To avoid this damage, organizations need to carry out an explorative learning that enables them to reconfigure their capabilities base (Lavie, 2006). Thus, market knowledge acquisition by an organization may be considered as a key element for explorative learning development (Lavie, 2006). Consequently, the following hypotheses are proposed.

H3 *Market knowledge positively affects knowledge creation.*

H3a *Customer orientation positively affects knowledge creation.*

H3b *Competitor orientation positively affects knowledge creation.*

H3c *Supplier orientation positively affects knowledge creation.*

Research Methodology

Instrument and Measurement

Given the research problem, research questions and research objectives, the most appropriate methodology for this study is survey. The instrument used for collecting the research data was questionnaires. The questionnaire was developed based on the instruments used by previous researchers. Except for demographic information, perceptual measures in the form of

statements were used for measuring each variable. For each statement, a corresponding Likert scale anchored as 1 for 'Strongly Disagree;' 2 for 'Disagree;' 3 for 'Neither Agree nor Disagree;' 4 for 'Agree' and 5 for 'Strongly Agree' was provided. The respondents are requested to respond to each of the statements by marking these scales. Prior to pilot testing and main data collection, the questionnaires were pre-tested with several experts in the field and also several innovative companies who could become prospective respondents. During the pre-testing exercise, the experts and the prospective respondents were requested to make constructive comments in various respects such as sentence structure, wordings, format, length and language used. Based on their feedbacks, the questionnaire was refined and revised accordingly. Subsequently, the questionnaire was pilot tested with 40 innovative companies. Using the IBM SPSS version 20, the responses of these 40 companies were analyzed by assessing the reliability of the measurements. The recorded Cronbach Alpha for all variables employing multi-items were well above 0.6, which suggested that the questionnaire was reliably sound (George & Mallery, 2003; Kline, 2005).

Population, Sampling and Data Collection

The population of the study was Thai innovative companies registered under the National Innovation Agency of Thailand (NIA) from 2004–2014. Those companies were chosen because of the researcher's easy access to the sampling frame. A total of 464 companies was identified as targeted respondents. Those companies were divided into three categories: 119 eco-industry companies, 236 design and solution companies and 109 bio-business companies. Research assistants among the students were engaged to distribute the questionnaire. The duration of data collection was three months. After the three months period was over, a total of 217 questionnaires were returned. However, 6 were found to be incomplete and 2 questionnaires were outliers for further analysis. The remaining 209 were analyzed using IBM SPSS and AMOS version 21. The statistical analyses carried out were frequency analysis; descriptive analysis focusing on median, standard deviation, variance and testing normality of distribution; exploratory factor analysis (EFA) for assessing unidimensionality; confirmatory factor analysis (CFA) for assessing the convergent validity and discriminant validity; and structural equation modelling (SEM) or structural model for testing the established hypotheses.

Findings

Respondents' Characteristics

Table 1 presents the demographic profiles of the respondents. Out of 209 respondents, the majority were companies located at the central zone

Table 1 Demographic Profile

Category	Group	Number	Percentage
Designation	Company owner	98	46.89
	R&D manager/head	111	53.11
Duration	Less than 5 years	81	38.76
	Less than 10 years	30	14.35
	More than 10 years	98	46.89
Types of companies	Eco-industry	93	44.50
	Design and Solution	72	34.45
	Bio-technology	44	21.05
Zone	Central	155	74.16
	North	14	6.70
	East	6	2.87
	Northeast	15	7.18
	West	1	0.48
	South	18	8.61
Employees	Less than 50	123	58.85
	50–200	44	21.05
	More than 200	42	20.10

(74.16%), while the minority was located in the west zone (0.48%). In terms of company size, the majority of respondents were small companies (58.85%) which have less than 50 employees. Concerning the company categories, 44.50% was eco-industry, 34.45% was design and solution, and 21.05% was bio-technology. Concerning the respondent's designation, 53.11% was R&D manager and 46.4% was company owner.

Assessment of Common Method Effect

Considering that all data in this study were self-reported and collected using the same questionnaire during the same period, the problem of having common method variance is quite possible. Podsakoff, MacKenzie and Bommer (2003) described that common method variance may cause systematic measurement errors and further bias the estimates of the true relationship among theoretical constructs. Common method variance is considered a major problem and a threat to the validity of the results if one factor accounts more than 50% of the variance in the dataset (Podsakoff & Organ, 1986). To cater this effect, the Harman's single factor test was executed. According to this test, if the result for factor analysis indicates a single factor or if any general factor accounts for more than 50% of the

Table 2 Univariate and Multivariate Normality

Variable	(1)	(2)	(3)	(2)
Market Outcome	–0.029	–0.172	–0.397	–1.170
Process Outcome	–0.335	–1.979	0.588	1.735
Product Outcome	–0.539	–3.179	0.158	0.466
Customer Orientation	–0.596	–3.519	0.095	0.280
Competitor Orientation	–0.501	–2.958	–0.038	–0.113
Supplier Orientation	–0.369	–2.180	0.104	0.307
Social Interaction	–0.473	–2.791	–0.134	–0.395
Organizational Routines	–0.585	–3.455	0.787	2.324
Information System	–0.468	–2.765	0.008	0.023
Multivariate			16.516	8.484

Notes Column headings are as follows: (1) skew, (2) composite reliability, (3) kurtosis.

covariance of the independent and dependent variables, this indicates the presence of a substantial amount of common method variance. All items from all constructs of the study were entered for analysis and constrained to a single factor. The results show that the single factor explained only 26.85% of the total variance, hence suggesting that the collected data is free from the threats of common method variance.

Assessment of Univariate and Multivariate Normality

The execution of SEM analysis requires that the observed data to be normally distributed. To meet this requirement, univariate normality and multivariate normality were assessed using several procedures. To test for univariate normality, the skewness and kurtosis of each observed variable were assessed. Kline (2005) stated that skew and kurtosis indices should not exceed an absolute value of 3 and 10 respectively. As shown in Table 2, the skewness and kurtosis requirements fulfilled the benchmark values suggested by Kline (2005). To assess multivariate normality, Bollen (1989) suggested that the Mardia's coefficient should be less than $p(p+2)$, where p is the number of observed variables. Taking into account that the model in this study has 36 observed variables, so $36(36+2)=1368$. The AMOS output for Mardia's coefficient is 16.516, which is less than 1368; hence, multivariate normality is fulfilled.

Validity Assessment

Validity was assessed in terms of convergent validity and discriminant validity. Convergent validity is the extent to which the scale correlates positively with other measures of the same constructs (Malhotra, 2002). Convergent validity can be evaluated by examining the *t*-value from CFA (Kaynak, 2003; Chen, Pauraj, & Lado, 2004; Sila & Ebrahimpour, 2005; Kim, 2010). Following Anderson and Gerbing (1988), coefficient for each item on its underlying

Table 3 Factor Loading, Standard Errors and *t*-Values

Constructs	Factors	(1)	(2)	(3)	(4)
Org. Knowledge	Social Interaction	1.000	0.603	–	–
	Organizational Routines	1.116	0.602	0.191	5.842
	Information System	0.984	0.690	0.150	6.560
Market Knowledge	Customer Orientation	0.910	0.744	0.100	9.100
	Competitor Orientation	1.163	0.738	0.128	9.086
	Supplier Orientation	1.000	0.737	–	–
Knowledge Creation	Product Outcome	1.000	0.640	–	–
	Process Outcome	1.242	0.825	0.156	5.288
	Market Outcome	0.970	0.691	0.122	7.950

Notes Column headings are as follows: (1) factor loading, (2) standardized loading, (3) standard error, (4) *t*-value.

construct was observed. An instrument has convergent validity if the correlations between measures of the same construct using different methods are high (Crocker & Algina, 1986). In measurement studies, each item in the scale can be considered a different method for measuring the construct (Ahire, Golhar, & Waller, 1996). A test of each item's coefficient was used to assess convergent validity. If coefficient for each item is twice greater than its standard error (*t*-value), then measures indicate high convergent validity (Krause, 1999). In other words, the *t*-value should be greater than two to achieve strong convergent validity. The *t*-value of each retained item is presented in Table 3. All *t*-values are significant indicating high convergence validity.

Besides assessing the convergent validity, the study also evaluated the discriminant validity. According to Malhotra (2002), discriminant validity is the extent to which a measure does not correlate with other constructs from which it is supposed to measure. To test the discriminant validity, three approaches were used. The first approach was to perform a chi-square difference test on all pairs of constructs via CFA (Bagozzi, Yi, & Phillips, 1991; Kim, 2010).

Alternatively, the second approach was to compare the Cronbach's Alpha of a construct and its correlations with other constructs (Kaynak, 2003; Kim 2010). According to the rule of thumb, discriminant validity can be achieved if the Cronbach's alpha is greater than the correlations (Sila & Ebrahimpour, 2005). The third approach, proposed by Fornell and Larcker (1981), is using AVE. To examine this effect, the discriminant validity of the construct is determined by comparing the square root of AVE of the variables with the correlation between the variables and all other variables. The second approach was used to test discriminant validity of this study. As displayed in Table 4, the Cronbach's α of the variables is well above the correlation values; hence, suggesting good discriminant validity.

Table 4 Discriminant Validity Assessment Using Cronbach's α

	SI	OR	IS	CO	ComO	SO	PO	PRO	MaO	α
SI	1.000									0.729
OR	0.410	1.000								0.827
IS	0.445	0.331	1.000							0.850
CO	0.312	0.381	0.295	1.000						0.843
ComO	0.242	0.279	0.290	0.554	1.000					0.865
SO	0.335	0.381	0.306	0.542	0.544	1.000				0.847
PO	0.252	0.164	0.205	0.265	0.348	0.258	1.000			0.708
PRO	0.377	0.283	0.308	0.412	0.440	0.334	0.513	1.000		0.716
MaO	0.288	0.256	0.175	0.342	0.351	0.255	0.501	0.557	1.000	0.713

Table 5 Fit Indices of Measurement and Structural Model

Fit index		(1)	(2)
Chi square (χ^2)			28.192
Degree of freedom			24
p-value (probability)		≥ 0.5	0.252
Absolute fit measures	MIN (χ^2)/df	3	1.175
	GFI (Goodness of Fit Index)	≥ 0.9	0.971
	RMSEA (Root Mean Square Error of Approximation)	≤ 0.05	0.029
	RMR (Root Mean Square Residual)	≤ 0.05	0.014
Incremental fit measures	NFI (Normed Fit Index)	≥ 0.9	0.952
	CFI (Comparative Fit Index)	≥ 0.9	0.992
Parsimony fit measures	AGFI (Adjusted Goodness of Fit Index)	≥ 0.8	0.945
	PNFI (Parsimonious Normed Fit Index)	≥ 0.5	0.635

Notes Column headings are as follows: (1) fit criteria, (2) measurement model.

Assessment of Overall Model Fit

The first thing many researchers look for upon obtaining the results of the SEM analysis is the output related to goodness-of-fit (Bowen & Guo, 2012). As illustrated in Table 6, the χ^2 statistics suggests that the data do not fit the model well ($\chi^2 = 28.192$, $df = 24$, $p < 0.5$). However, χ^2 is easily affected by sample size (Gerbing & Anderson 1985). The χ^2 statistic is not always an appropriate measure of a model's goodness-of-fit. Therefore, other fit indices as shown in Table 5 are used to examine the model's goodness-of-fit. Apparently, all of the recorded indices surpassed the fit criteria suggesting that the SEM model fits the data very well.

Structural Model and Hypotheses Testing

The Squared Multiple Correlation (R^2) value for the relationship between the six variables and knowledge creation was 0.49 suggesting that 49 percent

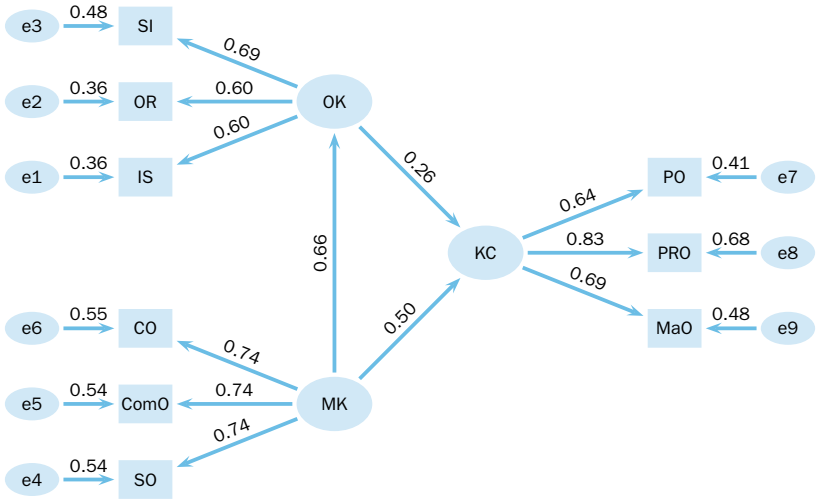

Figure 1 Structural Model

Table 6 Results of Hypotheses Testing

Hypothesis	*p*-value	Supported
H1: Market knowledge (MK) Organizational knowledge (OK)	< 0.01	Yes
H2: Organizational knowledge (OK) Knowledge creation (KC)	< 0.05	Yes
H2a: Social interaction (SI) Knowledge creation (KC)	< 0.01	Yes
H2b: Organizational routines (OR) Knowledge creation(KC)	< 0.01	Yes
H2c: Information system (IS) Knowledge creation (KC)	< 0.01	Yes
H3: Market knowledge (MK) Knowledge creation (KC)	< 0.01	Yes
H3a: Customer orientation (CO) Knowledge creation (KC)	< 0.01	Yes
H3b: Competitor orientation(ComO) Knowledge creation (KC)	< 0.01	Yes
H3c: Supplier orientation (SO) Knowledge creation (KC)	< 0.01	Yes

of the variance in knowledge creation can be explained by the combination of social interaction ($\beta = 0.248$, $p < 0.01$), organizational routines ($\beta = 0.36$, $p < 0.01$), information system ($\beta = 0.36$, $p < 0.01$), customer orientation ($\beta = 0.55$, $p < 0.01$), competitor orientation ($\beta = 0.54$, $p < 0.01$) and supplier orientation ($\beta = 0.54$, $p < 0.01$). The overall results summarized in Figure 1 and Table 6 indicates that all hypotheses were fully supported.

Discussion

The results of the current study provided additional evidence in support of previous findings that organizational knowledge is significantly influenced by market knowledge. The findings support the knowledge base view (KBV), which stated an organization should synthesize both organizational knowl-

edge and market knowledge for competitive advantage. An organization may integrate its pre-existing internal knowledge in the firm with market knowledge (Szulanski, 2003), as these new combinations generate new innovative knowledge (Gratton & Ghoshal, 2003). According to Nonaka and Toyama (2003), knowledge is created through the synthesis of thinking and actions of individuals. The theory of knowledge creation is based on an idealistic pragmatism, which synthesizes the rational pursuit of appropriate ends. The importance of exchanging and recombining knowledge resources (broadly speaking, the know-how of the firm) has been highlighted in previous works (Nonaka & Takeuchi, 1995; Conner & Prahalad, 1996).

The primary influences of organizational knowledge on knowledge creation as identified by Blayse and Key (2004) are social interaction, organizational routines and information system. The results of the study showed consistency with those researchers. All factors of organizational knowledge are statistically significant. The study showed that social interaction was the most influential factor on knowledge creation. This finding supports the studies of Lee and Choi (2007) and Von Krogh et al. (2000).

The study also showed that organizational routines significantly influenced knowledge creation, which was consistent with the studies conducted by Hoeve and Nieuwenhuis (2006) of a bakery factory in Holland, and Raven (1999), who studied an American company and a Swedish company. The analysis also supported the findings of a study in Zain Company conducted by Al-Gharibeh (2011), which showed that an information system significantly influenced knowledge creation. It indicates that technological advancement is a major source of improvement in the competitiveness of the firms and industries and subsequently increases the national growth and standard of living in a country (Gold, 1981).

The finding from the study also showed that all factors of market knowledge, customer orientation, competitor orientation and supplier orientation have an impact on knowledge creation. Statistically, customer orientation has more influence on knowledge creation than competitor orientation and supplier orientation. This finding was consistent with several previous studies (Kristensson, Matthing, & Johansson, 2008; Rowley, Kupiec-Teahan, & Leeming, 2007).

Conclusion

While this study has successfully achieved its objectives, it is however not without some limitation. Several possible limitations are worth noting in this study. Because the original measurement model was revised, it may not have measured the latent variables in the manner originally intended by the developers of the instruments. The fit measures and the psychometric properties of the original model needed to be reviewed. One reason

for the poor fit of the model to the data could be that the population of this study may have been significantly different with respect to the variables researched. Although the instruments in this study showed adequate psychometric properties, the study results using the revised factor structures were limited to the population and setting studied. Future research could replicate the study using a different population to shed more light on the underlying structure of the study constructs.

The implications of this research can be viewed from both theoretical and practical perspectives. From the theoretical viewpoint, the study has developed an empirical based framework that depicts critical factors influencing knowledge creation. Researchers specializing on the assessment of knowledge creation can consider adopting the framework for future studies. Alternatively, the framework can be further extended by other variables, such as variables that have indirect relationships in a market. From the practical viewpoint, the instrument that has been developed can be used as a diagnostic tool for continuous improvements of knowledge creation.

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Managerialism: An Ideology and its Evolution

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The article focuses attention on managerialism from the point of view of its ideological status. It traces the rise of managerialism, the main contributors to theorising about the nature of managerialism, and the characteristics and appeals of an outstanding managerialist text. The article begins by outlining the major features of the economic and social context in the United States, the United Kingdom and other Western countries that have contributed to the rise in the intellectual and social standing of the concept of managerialism. The problem of establishing consensus on the definition of managerialism is noted, as is the difficulty of positioning it within the conventional left-right political spectrum. The nature of an influential variant of managerialism known as 'socially responsible' management is then explored.

Keywords: management, managerialism, managers, shareholders, postwar consensus, neoliberalism, trade unions

Introduction

This article focuses on managerialism in terms of its ideological status. It charts the rise of managerialism, the main contours of the field of theorising about the nature of managerialism, and the characteristics and appeals of a salient managerialist text. As discussed below, there is no generally accepted definition of managerialism, but as a working definition it can be said that managerialism is an ideology based on the belief that optimisation of the productivity and outcomes of all organisations can be achieved through the application of managerial expertise, theories and techniques; this applies to both private and public organisations. The article begins by outlining the main features of the economic and social context in the United States, Britain and other Western economies that have contributed to the rise in the intellectual and social influence of the concept of managerialism. It notes the extreme difficulty of establishing consensus on the definition of managerialism and on positioning it within the usual left-right political spectrum. This is partly because of the highly ideological nature of the concept itself. It is suggested that many of the key conceptual components of managerialism have a much longer historical genealogy than is usually recognised. The emergence and recent rise in public awareness of the discourse of 'socially responsible' management is also examined.

Analysing managerialism is of crucial importance because in the last twenty years this ideology has risen to a position of intellectual and social prominence, if not dominance, impacting decision making in both the private and public sectors, as well as social policy more broadly. The ideology of managerialism has been implemented and has had major impacts at both the macroeconomic level and at the level of the firm or public entity. For that reason, the analysis of managerialism is of importance for those working at both of those levels. It is argued that those operating in the fields of business or management, or in economic and political life more generally, need to become more aware and more critical of the ideology of managerialism and its variants.

Economic and Cultural Shifts

During the decades after the Second World War, for thirty years or so in fact, the major Western economies enjoyed a period of relative stability and consistent growth. As a result of the experience of the Great Depression, Western governments were committed to a proactive approach to maintaining full employment. The ruling economic orthodoxy was Keynesianism, and governments were willing to use aggregate demand management, mainly by means of fiscal policy, to regulate levels of economic activity. Trade unionism was relatively strong, certainly compared to the subsequent period. Business accepted both a fairly high level of government intervention in the economy, and the presence of unionism in workplaces and at the bargaining table. This was the basis of the so-called postwar 'consensus.' This postwar consensus led people to talk hopefully of the 'end of ideology' (Bell, 1962).

At the time, things were certainly not experienced as so harmonious and stable as this thumb-nail sketch implies. To some extent, this pacific picture of economic relationships is an outcome of retrospect, an artefact of subsequent experience, and is often tinged with nostalgia. Nevertheless, there is clear evidence that a social compact of this type existed. Business was generally accepting of some limited restraints imposed by government, acknowledging the role of government as Keynesian stabiliser of the economy and as a means of ameliorating some of the harsher results of the market economy. Acceptance of trade union activity was more qualified, and varied between countries, with the least favourable environment being the United States, where the Taft-Hartley Act of 1947 severely curbed the prospects of union militancy.

This all changed in the 1970s, launching a new era of rising instability and higher risk. In many recent studies the 1970s has been identified as the 'pivotal decade' (Davis, 2009; Stein, 2010; Rodgers, 2011; Krippner, 2011, Madrick, 2011). Most often pointed to as pivotal moments were the so-called 'oil shocks' of 1973 and 1979, when policies of the Organization

of Petroleum Exporting Countries (OPEC), a cartel of oil-producing countries, suddenly raised the price of oil. In 1973 the Organization reacted to US and European support for Israel in the Yom Kippur War. The 1979 shock was associated with the Iranian revolution and the war between Iran and Iraq. The resulting price hikes sent shock waves through many Western economies. Inflation emerged as a pressing issue.

But there were other, more structural, problems that began to surface in the 1970s. By then, the postwar reconstruction of national economies in Europe, most notably West Germany, and in Asia, notably Japan, had succeeded to the extent that the products of the dominant Western countries, such as the United States, Britain and, to a lesser extent, Australia, were now facing stiffer international competition. In the relentless search for profits and low-cost venues, global capital ran over the borders of national economies. Globalisation and deindustrialisation became the hallmarks of the period. Manufacturing industries in particular now came under great pressure from other low-wage economies. In the early industrialised countries, the focus shifted from manufacturing to service industries, particularly finance, a process sometimes referred to as 'financialisation' (Krippner, 2011).

This is part of a long-term shift in the international balance of economic power, from dominance by the developed Western economies, towards the developing countries of Asia, Latin America and Africa. As this secular shift, together with the immediate shocks, worked their way through the Western economies, rates of profit began to fall, unemployment and underemployment rates gradually increased, pressure on government budgets became continuous. A new and unexpected phenomenon, stagflation (the combination of high unemployment together with high inflation) bewildered economists and policy makers. Such a combination was untheorised within the Keynesian paradigm. The buoyant economy of the 1960s was clearly at an end.

This was the context for the collapse of the previously established 'consensus.' The economic arena became markedly more conflictual. Struggling to maintain profits, at least domestically, businesses were no longer willing to countenance government regulation of their activities or, more broadly, an extensive role for government in the economy as a whole. Business also wished to clamp down on unions, which were fighting to maintain wage rates and jobs in the context of deindustrialisation and economic stagnation. By the end of the 1970s, the ideological conflict had become intense. Daniel Rodgers in *Age of Fracture* (2011) shows that the main themes of the succeeding decades were disaggregation and individualism. These decades were characterised by the rising ascendancy of neo-classical economics, monetarism, free markets, the New Right and libertarianism, all fostered

by influential conservative think tanks. Margaret Thatcher came to power in Britain in 1979, Ronald Reagan in the United States in 1981, and Helmut Kohl in Germany in 1982, and they proceeded to put into effect a new economic dispensation involving the suppression of unions, rescinding of welfare provisions, privatisation of public enterprises, lower taxes for the wealthy, and deregulation of financial markets. The big losers in the process were trade unions, pressured simultaneously by governments, business and unfavourable economic conditions. This was, consequently, a period of increasing income and wealth disparities and rising poverty.

From the 1970s, significant shifts in power also took place within the corporate world. Many analysts have characterised this as a transition from the postwar business system of 'managerial capitalism' to that of 'shareholder capitalism' since the 1970s (Davis, 2009; Locke & Spender, 2011). The fifties and sixties are said to have been the heyday of managerial capitalism. Based on and helping to form the consensus of the period, company managers played a pivotal role mediating between a wide range of economic interests, including government, employees, customers, shareholders, communities, and so on. Managers had a cooperative relationship with proactive governments at all levels. The system provided well-paid and continuing employment for most people, as well as accompanying benefits, such as pensions and health insurance, giving people a sense of security. At a time when social institutions in general were strong, managers made corporations themselves into social institutions. This was an era of what has been called 'corporate statesmanship' (Mizruchi, 2013). The resulting arrangements were stable and reliable, the business culture ordered, based on control by a gentlemanly elite. The term used most often in the literature to describe this corporate system is 'socially responsible.'

Major problems set in during the 1970s, beginning with the impact of the first oil shock. As the rate of growth in Western economies began to decline and the consensus started to falter, the position of managers came under fire from investors and shareholders concerned about the falling rate of profit. Academic economists, particularly of the neo-classical persuasion, were also at the forefront of the attack on the position of managers. In 1976 Jensen and Meckling published their landmark study on the theory of the firm, managerial behaviour, agency costs and ownership structures. Based on theories of 'agency conflict,' managers were accused of seeking the easy life through sweet-heart relationships with workers and government, to the detriment of profits and stock values. Pro-management writers often fail to mention or minimise the fact that during this period corporate managers were increasingly compensated by means of shares and stock options, a way of overcoming the agency problem by bringing managers' interests into closer alignment with those of corporate owners. This change in

patterns of remuneration became a powerful additional incentive for the rise of 'shareholder capitalism.' 'Shareholder value' became the mantra not only of shareholders and economists, but increasingly of corporate managers as well.

This system of 'shareholder capitalism,' which has reigned for forty years, has been, in comparison to the years of consensus, more volatile and insecure; the business culture it has created has become more competitive. Companies are said to have broken their relationships with both government and employees. In many cases, employees have lost their jobs or their previous working conditions in the context of automation, globalisation and deindustrialisation. Contemporary corporations are supposed to have lost connection with communities. In short, they have become less 'socially responsible.' It was within this broad economic and social context that the concept of managerialism and its analysis attained a level of social and intellectual salience that it had never previously enjoyed.

Managerialism: Being Definitive

Turning now to the question of definition, as for other ideas, ideologies or 'isms,' defining managerialism is difficult and fraught with contention. Very few of the major writers working in this field have given an explicit definition of managerialism. The notion that an uncontested definition is possible before entering the battlefield of ideas is a myth. Perhaps John Quiggin (2003) of the University of Queensland provides a useful and widely accepted starting point:

> The central doctrine of managerialism is that the differences between such organisations as, for example, a university and a motor-vehicle company, are less important than the similarities, and that the performance of all organisations can be optimised by the application of generic management skills and theory.

This definition, offered on Quiggin's blog in 2003, has proved to be popular, if it cannot actually be said to have 'gone viral,' having now found its way into the published academic literature on the subject (Glow & Minahan, 2007, p. 5; MacRitchie, 2011, p. 57). In more concrete terms, and according to Quiggin, the implementation of managerialism is recognisable by a marked shift in the economic and power relations between senior managers and employees, especially professionals: 'The main features of managerialist policy are incessant organisational restructuring, sharpening of incentives, and expansion in the number, power and remuneration of senior managers, with a corresponding downgrading of the role of skilled workers, and particularly of professionals' (Quiggin, 2003).

Another definition is given by Robert Locke, who has written extensively on management and managerialism, a definition in which the emphasis is placed directly on political considerations (2009, p. 28):

> What occurs when a special group, called management, ensconces itself systematically in an organization and deprives owners and employees of the decision-making power (including the distribution of emoluments) – and justifies that takeover on the grounds of the managing group's education and exclusive possession of the codified bodies of knowledge and know-how necessary to the efficient running of the organization.

Clearly both of these definitions offered by Quiggin and Locke are programmatic definitions, closely intertwined with the arguments they wish to make about managerialism and the positions they adopt with respect to it. Often in this literature, analysts' evaluations of managerialism, their ideological commitments, drive their definitions and descriptions of it. As their various theories are outlined in the rest of the paper, the way in which they conceptualise managerialism will emerge from the discussion.

Right or Left; and How Far Back?

The politics of managerialism and its genealogy in terms of its antecedents in political philosophy are extremely mixed. For instance, within a historical perspective, situating managerialism on the left or right of the political spectrum proves to be even more difficult than establishing a definition. This section of the paper is devoted to canvassing the field of ideas about whether managerialism should be associated with the left or right of politics and, at the same time, to giving an indication of the historical longevity of some of these debates. The first thing to note is that there is no consensus whatsoever on locating managerialism within any spectrum of political ideologies.

In their comprehensive study of the impact of 'cultures of management' in Britain over a thirty-year period, Robert Protherough and John Pick examine the effects on the arts, education and religion, as well as on economic life. They conclude by discussing whether modern managerialism should be considered a political system, a means of exerting political control. Answering in the affirmative, they emphasise the resemblance to Marxism (Protherough & Pick, 2002, p. 202):

> It is perhaps Marxism that modern managerialism most nearly resembles. Like Marxism, it is capable of infiltrating and distorting the workings of many kinds of organisation. Like Marxism it works primarily by colonising and colouring everyday language. And like Marxism it

asserts that all creation, imagination and cultivation stem from measurable material processes.

The resemblance consists, according to Protherough and Pick, mainly in their common commitment to materialism. Consequently, perhaps 'the closest comparison is with the glum orthodoxy which drove the Soviet bureaucrats' (2002, p. 201). After fifty years of Cold War polarisation, during which the USSR was entrenched in the West as national enemy No. 1, forging a mental link between managerialism and the evil empire was doubtlessly an effective rhetorical strategy for these critics of managerial culture. Conjuring up thoughts of Stalin's characterisation of artists as 'engineers of the soul,' Protherough and Pick cite the managers of Britain's 'creative industries' as promoting 'as mechanistic a view of cultural evolution as could be found anywhere in history' (2002, p. 202). Protherough and Pick do concede, however, that Karl Marx himself was not guilty of such crass materialism. Nevertheless, they definitely trace the forerunners of managerialism to the far left. There is indeed a longer tradition of associations between managerialism and the left, which can be traced back, through the utopian socialists such as Henri Saint-Simon and Auguste Comte, to the dawn of modern history with the French Revolution. That canonical conservative Edmund Burke memorably linked the spirit of the revolution to the predominance of 'sophisters, economists, and calculators.' The rise of these representatives of materialism and demystified rationalism, according to Burke, portended the eclipse of the age of 'chivalry' as the characteristic ideology of feudalism (Burke, 1864, pp. 515–516). In terms of the politics of the day, of course, the revolutionaries of France were representatives of the left.

On the other hand, linkages between managerialism and movements of the right have also been asserted. In the recent literature on managerialism, it is this link that is made most frequently. For example, in *Confronting Managerialism* (2011) Robert Locke and J.-C. Spender identify the source of managerialism, or at least its most recent forward impetus, variously as: neoclassical economics, University of Chicago economists, Hayek and his generation of neoliberal economists, finance economics, 'neoliberal market-driven capitalism' and 'aggressive neoliberalism' (pp. 14–17, p. 59, p. xvi, p. xviii, p. 143, p. 145). Similarly, according to Quiggin, managerialism is associated historically with 'the radical program of market-oriented reforms variously referred to as Thatcherism, economic rationalism and neoliberalism' (Quiggin, 2003). In the same vein, Richard Hil (2012) identifies the broader context for his study of the market-driven transformation of universities as a mixture of 'economic rationalism, commercialisation, managerialism, corporate governance and other outgrowths of neo-liberal ideology' (p. 10). Thus the origins of managerialism have often been sought on the

political right, more specifically in a range of ideological positions associated with the New Right. However a longer historical trajectory can also be traced. There have been close links between managerialist approaches and both fascism and nazism, along with futurism and addiction to high tech (Baker, 2006). A century before that, the administrative reforms forcibly implemented in Prussia under king Frederick William III (1797–1840) can also be seen within the same tradition; these amounted to the creation of a police state, with close regulation of important areas of social relations including government, the economy, religion, education, culture, family and everyday conduct (Holborn, 1982, pp. 468–507).

There is also a lineage associating managerialism with totalitarianism in general, whether of the right, left, or centre. This idea was developed and widely disseminated in the work of James Burnham on *The Managerial Revolution* (1941). In the midst of the Second World War, Burnham predicted that the future would be neither capitalist nor socialist, but the dominance of an oligarchic group of experts he called the 'managers.' This group, rather than the owners of private property, would provide economic leadership. Society would not be democratic, but based on centralisation of control, centred on economic planning rather than the free market. Those exerting effective control over the means of production would be a managerial class of business executives, bureaucrats and social engineers, assisted by technicians and scientists. The power of the previous ruling class of capitalists would be toppled, and the working class would be cowed and exploited, reduced to serfdom. The managerial society would be strictly hierarchical, with the ruling managerial elite oppressing a mass of downtrodden workers. It would be a society of strict binaries: 'the powerful and the weak, the privileged and the oppressed, the rulers and the ruled' (p. 138). Burnham believed that managerialism had reached its fullest development in the USSR, ostensibly under socialism, but was almost equally well developed in Germany under nazism and Italy under fascism, and was in the process of entrenching itself in the United States under capitalism, especially with the New Deal and war economy, and that the trend was, in fact, universal.

Placing this war-time study within a wider context, Burnham's analysis was strongly influenced by that of Hilaire Belloc in *The Servile State* (1912). Belloc argued that the unsustainable evil of capitalism, together with its resultant collectivist reformism, would produce a third way: what he called a servile state in which the majority of people would be legally bound to labour for the benefit of the few. A somewhat similar theory was developed around the same time by the rather eccentric but often prescient American economist Thorstein Veblen, who foresaw a revolution by engineers and technicians, and the replacement of business owners and managers by a specially trained technocratic class that undertook economic planning

(Pena, 2001, pp. 1–27). George Orwell reviewed Burnham's book at length and on the whole approvingly, and it seems clear that Burnham's ideas influenced Orwell's thinking on the probable contours of the dystopia of the future, which bore fruit in *Animal Farm* (1945) and *1984* (1949). Despite his startlingly abysmal record in making international geo-political predictions, Burnham has continued to be influential in the broad field of studies of managerialist social organisation. Since its publication, *The Managerial Revolution* has been regarded as a seminal text in the field, and has indeed experienced a marked resurgence of interest in the last two decades (Borgognone, 1999, 2000; Pena, 2001; Kelly, 2002).

In view of the complete lack of consensus regarding the ideological affiliations of managerialism, it is not surprising that it has been suggested that managerialism has developed as a sort of grab-bag of ideological inputs, a confluence of various – sometimes incompatible – ideological streams. Thus, Christopher Hutton has described it as a 'black hole of ideology, sucking in and neutralizing all mainstream socio-political philosophies.' Among other things, he contends, it has swallowed up both 'Thatcherism and 1968' (Hutton, 2012, p. 362).

A growing perception that it is fruitless to try to trace the confused ideological affinities of managerialism has also prompted the thought that it is in fact an ideology in itself, *sui generis.* In his 1993 analysis of managerialism as a totally new and distinct ideology, Willard Enteman contends that a new ideology emerged in advanced industrialised societies in the second half of the twentieth century, growing out of pragmatic decision making by 'practical people' faced with making choices and taking action. He warns that it is possible to be distracted from an understanding of the emerging reality by thinking that the ideological principles that guide managers' decision making are 'capitalist or socialist, democratic or totalitarian, or some combination' (1993, p. 153). Enteman argues instead that managerialism, considered as a separate ideology in its own right, provides 'a more useful clinical description of what is occurring in advanced industrialized societies than any existing alternative ideologies offer, including capitalism, socialism, and democracy' (p. 154). Enteman does not provide a definition as such, but gives a basic description of a managerialist society as one in which the fundamental social unit is neither the individual nor the state, but the organisation. For managerialism, the individual and the state are merely empty abstractions. Managerialism denies that the fundamental nature of society is an aggregation of individuals. Social decision making arises from the transactions that take place between managements of organisations. Managerialism is an ideology created by managers. Certainly it is not democratic; a managerialist society does not respond to 'the needs, desires, and wishes of a majority of its citizens' (p. 154). Enteman is not a defender of

managerialism, for which he 'cannot find sufficient moral warrant' (p. 154). He contends that the justification for the new ideology is currently very weak, partly because it evolved in a context of the breakdown of the previous ruling ideologies of capitalism, socialism and democracy, and as yet intellectuals have not developed any persuasive justification for it (p. 192).

The Discourse of 'Socially Responsible' Management

Although Enteman remains dubious about the intellectual and moral rationale for managerialism, recent economic developments on the global scale have given rise to an ethical discourse of so-called 'socially responsible' management. This discourse has come to the fore as a result of the financial and economic crisis that brought the global economic system to the brink of collapse in 2008. The crisis called attention to deeply entrenched inefficiency and dishonesty at the highest levels of the managerial elite in the financial sector. Disillusionment and discontent with the social and economic power of managers was expressed not only on the left of the political spectrum, but also in groupings on the right, such as the far-right populist Tea Party movement in the United States. Even Alan Greenspan, who chaired the US Federal Reserve from 1987 to 2006, admitted that he had made a mistake in trusting that concern for their reputations would constrain the managers of banks and other institutions from practising fraud and deception. This new atmosphere of public outrage and contempt generated popular and political pressure to curb the power of the top managers and to reduce their, often gross, levels of financial remuneration. This was, to put it simply, a crisis of legitimation for the managerial class.

But the Global Financial Crisis (GFC) and the ensuing Great Recession were only the last in a long series of corporate collapses and scandals. For instance, the previous decade or so saw the collapse of Enron, WorldCom, Arthur Andersen, AIG, Lehman Brothers, Bear Stearns and Merrill Lynch in the United States; of the Royal Bank of Scotland, Northern Rock, Lloyds, and Anglo Irish Bank in Britain; and, for example, of HIH, FAI, Storm Financial, and ABC Learning in Australia. Widely publicised throughout the Western world, including the United States, Europe, Australia and New Zealand, have been high profile cases of corporate scandal and questionable business ethics, giving rise to public contempt for management in general. In the wake of the GFC (2007–), following upon the dot.com collapse in 2000–2001 and the Enron debacle in 2002, there has been a widespread sense that there are grave problems with corporate management, especially in the United States. In other words, an intense quest for legitimacy on the part of the business community is of long standing and has been ongoing for more than a decade.

In his incisive analysis of the causes and significance of the Global Finan-

cial Crisis, *Freefall* (2010), Joseph Stiglitz sardonically suggests that those who prospered under the pre-GFC regime of deregulated markets and lax supervision would tend to minimise the significance of the crash and would recommend fairly superficial ways of responding to it: rescue the banks and bankers, tweak the regulations, tell the regulators to be a bit more vigilant and – significantly for this study – 'add a few more business school courses on ethics' (p. xiv). It is in this context that the influential discourse of 'socially responsible' management has risen to prominence.

There are many competing definitions of 'socially responsible' management. As regards the private sector, it is often discussed under the rubric of Corporate Social Responsibility (frequently abbreviated to CSR). A widely accepted definition was given by Richard Holme and Phil Watts, for example, in *Making Good Business Sense* (2000), published by the World Business Council for Sustainable Development: 'the continuing commitment by business to behave ethically and contribute to economic development while improving the quality of life of the workforce and their families as well as the local community and society at large' (p. 8). Behind such anodyne terminology, it is important to recognise the claims this discourse makes on behalf of the interests of managers. It is this development that James Burnham, Hilaire Belloc, Willard Enteman and other theorists warned about.

It would be easy enough to dismiss management literature as a whole as a 'glorified form of public relations' (Frank, 2010, p. 221). However, to gain an insight into the type of thinking that informs the culture of managerialism and socially responsible management, in this paper a salient book will be considered in detail: *Confronting Managerialism: How the Business Elite and Their Schools Threw Our Lives Out of Balance* (2011) by Robert R. Locke & J.-C. Spender. It would be easy for some in the academic community to dismiss the cultural productions emanating from business schools and so-called management 'gurus' as simplistic, emotive, biased, even out of touch with reality. But that would be a mistake if we wish to comprehend the wide appeal of these texts, as evidenced for instance in the serried masses of them on the shelves of major book stores, and the influence they exert on political and economic decision-making in society as a whole. To understand that influence, we need to begin by reading the texts attentively and taking their contents seriously. Paying close attention to the actual statements made in these texts will allow us to gain insights into their potent mixture of idealism and disillusionment, egalitarianism and elitism, radicalism and conservatism.

Placing themselves firmly within the field of 'socially responsible' management, Robert Locke and J.-C. Spender are management consultants and former deans of business schools. In *Confronting Managerialism* (2011), they advocate the reform of managerialism from within, to make it more hu-

mane, as well as more productive. Their subtitle, *How the Business Elite and Their Schools Threw Our Lives out of Balance,* is an admission that something serious has gone wrong in the field of management, and an indication of where they see the rot.

Locke and Spender's argument operates on a binary logic: on the basis of a distinction between managerialism (bad) and management (good). From this it follows that two types of managers are conceivable: Good Managers and Bad Managers (my terms, not theirs). They describe the adherents of managerialism as a 'caste,' with implications that they are an exclusivist elite with pretensions to superiority over others. The picture on the front of my paperback edition of their book shows a male figure in a dominating pose, wide-shouldered, power-dressed, smoking a cigar, with a 50s haircut, a blank face, and with dollar signs for his eyes. This is presumably the repellent figure of a Bad Manager, a follower of the cult of managerialism. This extreme caricature emphasises the reductive nature of the dualistic logic their argument employs.

In the preface, the authors deny that they want to evoke an image of an earlier Golden Age of 'socially responsible' management, and to an extent they do avoid this, mainly because of their imprecise and shifting chronology of the emergence of managerialism. Nevertheless, the argument does depend on the impression they create of the halcyon days of management in the 1950s and 1960s, especially in the United States, when management (Locke and Spender, 2011, p. 82)

> [...] did not consider itself, nor was it considered postwar, a bunch of unprincipled ruffians. Definitions of managerialism usually pointed out at the time that managers, although their fiduciary duty was to stockholders, had the moral duty to look after the well-being of other stakeholders in the firm and to be good corporate citizens. The post-1945 version of managerialism, moreover, cobbled together elements of a partnership between the management caste, big labor, and government first hammered out during the New Deal and World War Two.

According to Locke and Spender, these principled managers of the 1950s and 1960s were capable of reconciling, from Olympian heights, the conflicting interests of capitalist investors, workers and unions, government, and presumably their own, thus ensuring peace and prosperity on the battlefields of business. The outcomes, according to the authors, were particularly attractive for employees, promoting amicable relations between management and workers and indeed an extension of democracy in industry: 'Heralded collective bargaining agreements provided for better wages and working conditions; they introduced company retirement plans, medical plans, and other social benefits' (p. 82).

In essence *Confronting Managerialism* represents another manoeuvre in the historic battle between owners (including entrepreneurs and shareholders) and managers. By its critique of the functioning of business schools in the United States and its recommendations for reform, *Confronting Managerialism* also stakes a claim within the multi-billion dollar management education industry (worth over 900 billion dollars in the US). Conflict between managers and owners, referred to by economists as 'agency conflict,' is addressed by Locke and Spender (p. 140) as follows:

> This conflict arose after 1980 because the management caste increasingly lived under the tyranny of stock market valuations and the demands of institutional investors. To satisfy the latter's preoccupation with the price of a company's stock, corporate management tended to the bottom line, that is, it shored up short-term profits so that stock market analysts' expectations would be met and its company's stock price would benefit accordingly [. . .] If, however, the high stock valuations were achieved at the firm's expense, conflict between professional management and the firm as an entity exists, even though there is little conflict between management and its institutional stockholders.

Here Locke and Spender (2011) assert a claim on the part of managers to know better than owners what is good for the firm, and to be given latitude and discretion in their decision-making without having to endure the 'tyranny' of the market. Indeed the authors identify the opposition, the enemy, the source of all the problems variously as: neoclassical economics (pp. 14-17, p. 59), University of Chicago economists (p. xvi), Hayek and his generation of neoliberal economists (p. xviii), finance economics, 'neoliberal market-driven capitalism' (p. 143) and 'aggressive neoliberalism' (p. 145). Thus in *Confronting Managerialism* Locke and Spender stake out a claim on the part of managers to the economic rents – presumably sizeable considering the intensity of the conflict being waged over them – generated by capitalist economic activity. Like Plato's guardian caste, Good Managers are supposed to be capable of mediating sagely among competing interests – such as shareholders, workers, unions, environmentalists, consumers, local communities, government, and managers – to strike a just balance among the rival claims of the warring elements of contemporary economic and political life. To do this, like Plato's guardians, they are supposed to require a special education to fit them for social leadership and equip them to make 'socially responsible' moral judgments. Courses in 'socially responsible' management at business schools would do this, affirm Locke and Spender. This argument is consistent with the recent trend to what Slavoj Zizek has called, a little crazily, 'liberal communism,' which con-

sists of attempts by such heroes of capitalist enterprise as George Soros and Bill Gates to give capitalism a more humane face. This would be the face of Locke and Spender's Good Manager after having received training in 'socially responsible' management, presumably at their approved business schools.

Locke and Spender's positive recommendations are briefly set out in their conclusion. To counter the effects of managerialism in producing 'bad management,' they recommend reform in the governance of companies to strengthen the position of managers. This is partly intended to protect the firm from marauding outside predators. Internally, Locke and Spender also want the position of management to be reinforced in order to protect the firm from the power of shareholders and investors. In particular, they refer approvingly to the statement on German Generally Accepted Management Principles, which allows managing directors of a company to carry out a 'protective function' that stops shareholders from making 'exaggerated demands' on the firm (p. 186). Although couched in the ethical terms of 'socially responsible' management, Locke and Spender's book consistently asserts the claims and interests, both political and economic, of managers as a group. Their approach could therefore be expected to be very appealing to managers and potential managers. On the surface, the binary logic they use divorces 'socially responsible' management from managerialism, attempting to put as much distance as possible between their position and the corporate scandals of the recent past. But their argument actually asserts the claims of managers more forcefully than ever before, in a new, more nuanced variant of managerialism presented in a more sophisticated register.

Conclusion

By charting the major economic developments of the latter half of the twentieth century, it has been shown that the 1970s represented a pivotal turning point in many Western economies, giving rise to new forms of economic behaviour and to the emergence into prominence of something known as 'managerialism.' Probing into the definition of managerialism, it was found that it was difficult to find any consensus on the meaning of the term. Locating it within a left-to-right political spectrum proved equally difficult. It was suggested that many of the key components of the concept of managerialism have a much longer historical genealogy than many assume. The recent emergence of an influential variant on managerialism called 'socially responsible' management was discussed.

This paper has also offered an analysis of an influential text produced by prominent management 'gurus,' a text that I would place within the broad stream of managerialist literature, but putting forward the more nuanced

arguments of 'socially responsible' managerialism. The aim was to begin to comprehend the appeal of such texts and the influence they exert both on the behaviour of those who read them, including managers as well as management educators, and on the creation and maintenance of broader political and social ideologies. Unpicking the rhetoric of managerialism and management literature allows us to gain some perspective on their claims, which in turn encourages the questioning of their normative prescriptions and the sources of authority to which they appeal. Even though such texts often appear to be unsophisticated and even anti-intellectual in tone, cultural researchers should take the words of management theorists seriously, should engage with and critique their assertions, thus opening them up to challenge and exposing them to democratic debate.

One of the most important implications of this study is to draw attention to the way that managerialism, including the ideas of 'socially responsible' management, seeks to protect and advance the interests of managers as a group. It is important to open up the claims they make on behalf of the interests of management to open intellectual enquiry and democratic debate. Many of the theorists whose works have been canvassed here have made significant contributions to uncovering the assumptions and rhetorical strategies used to further those interests. For those engaged in the fields of business and administration, and in economic and political life more generally, it is essential to be aware of other often competing interests, whether those of employees and unions, investors, owners, clients, financial institutions, local communities or government bodies. In terms of pointing out possible directions for future research, there is an urgent need to develop a critical theory of managerialism, or at least the application of critical theoretic concepts to managerialism and the discourse of 'socially responsible' management. This article is offered as a step in that direction.

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Directed Innovation of Business Models

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Business model innovation is an important issue to keep business competitive and increase company's profits. Due to many market attractors, identification of appropriate paths of business model evolution is a painful and risky process. To improve decision's effectiveness in this process, an architectural construct of analysis and conceptualization for business model innovation that combines directed evolution and blue ocean concepts is proposed in this paper under the name of directed innovation. It displays the key points where innovations would happen to direct adaptation of the business model towards sustainable competitiveness. Formulation of mature solutions is supported by inventive problem solving tools. The significance of the directed innovation approach is demonstrated in a case study dealing with business model innovation of a software company.

Keywords: business model, directed innovation, blue ocean space, directed evolution, innovation determinants, university

Introduction

The progress of technology, especially the communication technologies and Internet, as well as the modern means of fast transportation for long distances, has dramatically increased the speed at which many technology-oriented businesses are running today. Speed for running businesses is in fact a critical issue. The progress in communication, information and mobility technologies has facilitated the increase of competition in the global market, because more companies can reach a market in every corner of the planet and information about competitors and suppliers at global scale is relatively ease to obtain. Being recognized the crucial role that technical performance plays in the commercial success of any product, in nowadays digital-driven global market focusing business competitiveness only on product performance is not enough. It is for sure a necessary condition for keeping competitive, but it is not sufficient. This is caused by the fact that what is new today on the market will have one or more competitive correspondents in a few months period.

Recent surveys of a consulting institute from Switzerland – BMI Lab –

revealed the fact that product innovation has a potential to supplement the profit with about 1.7% in 3 years and with about 0.1% in 5 years, whereas business model innovation has a potential of supplementing the profit with 8.5% in 3 years and with 6% in 5 years (Hofmann, 2014). These numbers describe average values of data collected from different industrial sectors. The conclusion is that business model innovation can bring much more value to the business than product innovation, because the synergies created behind the business model cannot be copied and replicated so easy and so fast. Thus, special attention should be paid to the formulation of effective business models with respect to some performance indicators.

This paper comes from the position that effective business models cannot be designed without considering their existence in connection with the external environment and the context in which it evolves. In addition, this paper claims that effectiveness of business models cannot be fully achieved without strong differentiation in the space of competition. Searching in the published literature on these issues, the result is that many research works on business models and business model innovation recognize that dynamics in business environment is an important influence factor on business model's effectiveness (Demil & Lecocq, 2010, p. 238; Achtenhagen, Melin, & Naldi, 2013, p. 428; Morioka, Evans, & Monteiro de Carvalho, 2016, pp. 660–661). Also, some works show that appropriation of business models shall be reflected in relation with the context in which businesses operate, too (McNamara et al., 2013; Souto, 2015; Hall & Roelich, 2016; Zhao, Pan, & Lu, 2016). From these perspectives, it is accepted that business models have to be designed following a more structured methodological approach and consideration of clear strategic goals, rather than using empirical approaches. Various proposals are reported in the literature in line with this issue. For example, Toro-Jarrin, Ponce-Jaramillo, and Guemes-Castorena (2010) integrate Business Model Canvas and Technological Roadmap to align business ideas with the current and future business needs. It brings customer validation as an important step in business model design.

However, competitiveness of the business model strongly depends on several other critical elements, such as constrains that are outside the control capability of the company, as well as effectiveness at operational level of competitors' business models. These issues are not treated in the work of Toro-Jarrin et al. (2010). Structured methodologies for business model innovation are necessary even in the case of ubiquitous and profitable business models, as long as they are more and more challenged by disruptive businesses in emerging markets, which are capable to lower the costs for similar value delivery (Williamson, 2010).

This work is also a supporter of the necessity to consider business model innovation from a system perspective, considering the influences

of the upper systems on the lower systems. It strengthens the idea that the external business environment is a strong influencer in the process of business model innovation. A particular perspective of this statement is also given by Aspara, Lamberg, Laukia, and Tikkanen (2013), which demonstrate in their work that business models of business units are strongly influenced by the corporate business model. This is a very important observation for long term sustainability of corporate businesses, where the corporate business model might create strong barriers when designing the business models of various business units. In this respect, application of inventive problem tools to solve various conflicts between parent-child business models is essential. Existence of paradoxes and conflicts in the case of complex business models is recognized and documented by Smith, Binns, and Thusman (2010), too. Their work highlights the need to solve such paradoxes in a way that makes them to coexist rather than selecting one variant. This way of focusing business model innovation also supports the demarche of the current paper. Joyce and Paquin (2016) provide an extended perspective of the business model, by projecting it on three plans: economic, environmental and social.

This work puts into evidence a more complicated external environment from which business models have to be designed. Similar observations are done by Franca, Broman, Robert, and Basile (2016), Morioka et al. (2016) and Yang, Evans, Vladimirova, and Rana (2016), whose focus is mainly on the extension of business model's perspective by adding the environmental perspective to the economic one, too. This works reflect once more the challenges on business model innovation of various external regulatory constraints. Bolton and Hannon's work (2016) also highlights the influence of external factors such as governing context and socio-technical context on business model innovation. Beyond the relevance of external influence factors on business model innovation, reduction of effort and risks in defining an effective business model is another critical aspect in business model innovation. Research done by McGrath (2010) show that people tend to define the business model following many experimentations and discovery-driven approaches with no clear understanding at the outset of who the winners will be. Even if experimentation is good, avoidance of trial-and-errors approaches and consideration of a more convergent innovation process of the business model is desirable in a highly dynamic external business environment.

Despite the valuable contributions done by now on contextualizing business model innovation, there are no researches yet developed on how to approach in a systematic way the external influence factors during the design process of business models. Also, there is no research reported on how to think innovation of business models, such as the proposed solution

to ensure a competition with positive sum (e.g., by being unique). In line with these observations, the purpose of this paper is to introduce a structured approach to analyse a given business model and to innovate it acting simultaneously on two streams: formulating conflict-free solutions to various constrains generated on the business model by the influence factors from the outside/external business environment, and increasing its differentiation with respect to key competitors. The research question of this study is: How can a business model be properly designed such as its value creation formula overpasses various limitations imposed by regulations and other influence factors in the business environment in the best possible way, and how value creation can be achieved in a way that makes a visible difference in the market?

In this respect, the next section of the paper is dedicated to pass in review the perspective of business model from different angles, as well as of business model innovation. The section ends with a synoptic of the most relevant published research results on methodologies for business model innovation. It is concluded that most innovations of the business models (about 90% with respect to some survey-based investigations) are re-combinations of already known practices in the field (Gassmann, Frankenberger, & Csik, 2013, p. 3). In the third section of the paper, a roadmap for systematically tackling innovation of business models is proposed. It is based on the concept of directed evolution that emerged from the theory of technical system evolution. Therefore, a small space in the third section of the paper is dedicated to outline the concept of directed evolution. The section continues with the description of the roadmap and its related tools. The proposed methodology was applied for improving the business model of an IT company specialized in software services. It proves that the methodology has several strengths in identifying the core areas of intervention for innovating business models. A critical analysis of this research work is included in the section of conclusions. This section also reflects on areas where further researches could be done in the future. Key findings complement the content of conclusions.

Background

This part of the paper is dedicated to highlight several perspectives about business models and relevant studies up to this date about methodologies that support business model innovation or transformation. The subject is well-sustained by a recent survey performed by KPMG, which shows that over 90% of the US companies are changing their business models (KPMG, 2013). A reason for this course of actions is the fact that releasing new products is not sufficient to keep a competitive advantage onto the market (Gassmann et al., 2013, p. 1).

Business Model

Business model literature is diverse in defining this concept. This is well captured by Gassmann et al., which states that there is no 'common opinion as to which components exactly make up a business model' (Gassmann et al., 2013, p. 1). As Michael Lewis said, a business model 'is one of those things many people feel they can recognize when they see it (especially a particularly clever or terrible one) but can't quite define' (Ovans, 2015). The term 'business model' was first introduced in the literature by Peter Drucker and seen as 'assumptions about what a company gets paid for' (Drucker, 1994). According to Joan Magretta, a business model is the managerial equivalent of a scientific method – it is a hypothesis about the business, which is then tested and revised, if necessary (Magretta, 2002). In principle, a business model is the architectural arrangement of all elements of an organization needed to achieve its strategic goals and objectives (Al-Debei et al., 2008, p. 1). A more tangible perspective on business model definition is given by Johnson, Christensen and Kagermann (2011) in their work 'Reinventing Your Business Model.' They consider a business model the interlocking of customer value proposition, profit formula, key resources and key processes that, taken as an aggregate, produce and deliver value to customers (Johnson et al., 2011, pp. 45-47). A structured work for understanding the significance of a business model and its link with strategy and innovation is done by Teece (2010). He concludes that the 'essence of a business model is in defining the manner by which the enterprise delivers value to customers, entices customers to pay for value, and converts those payments to profit.' Baden-Fuller and Morgan (2010) has run a research to analyze business models from a model perspective. They provide a set of generic descriptors of how a company organizes itself to create and deliver value in a profitable way. This work promotes the idea that business models are a kind of receipt for creative managers to describe their businesses. But maybe the most intuitive way of formulating a business model is the canvas proposed by Strategyzer AG consulting company (https://strategyzer.com/). The canvas was actually invented by Alex Osterwalder within his PhD thesis and it encompasses nine building blocks of the business model: customer segments, value propositions, distribution channels, customer relationships, revenue streams, key resources, key activities, key partnerships and cost structure (Osterwalder & Pigneur, 2009). Another suggestive description of a business model is the one formulated by Gassmann and his colleagues. They see a business model conceptualized around four key pillars: who, what, how, and value (Gassmann et al., 2014). Generic 'who' actually describes target customers. Generic 'what' are all issues about offering. 'How' equals value proposition creation. 'Value' means revenue

creation. Between 'who' and 'what' a value proposition is formulated. The binome 'who' and 'how' germinates the value chain. 'Who' combined with 'value' builds the revenue model (Gassmann et al., 2013, p. 2). A last perspective introduced in this paper on business models is the one promoted by Boston Consulting Group. It considers business models as two blocks: value proposition and operational model, where each block has three elements at its turn, that is: value proposition comprises target segments, product and service offering, revenue model, whereas operational model comprises value chain, organization and cost model (Lindgardt, Reeves, Stalk, & Deimler, 2009, p. 2). More or less, all definitions introduced in this paper lead to the same perspective of a business model, but following different routes. This is well captured by Massa and Tucci, which refer to levels of abstraction from reality of the business models (Massa & Tucci, 2013, p. 433). According to this reference, the lowest layer of abstraction is the activity systems, followed by meta-models, then by specified graphic frameworks, and further by ontologies, ending on the highest layer of abstraction with archetypes.

By synthesizing business model literature, the authors of this paper have formulated a new representation of the business model, one that is linked to business strategy and displays quantitative measures of its value. This new representation is presented in Figure 1.

The model from Figure 1 suggests that for the same problem, more business models can be formulated. Some of them would be more competitive than others. The model from Figure 1 considers two type of values: the one for customers (the reason for going on the market) and the one for shareholders (the motivation for running the business). Both types of value are strongly linked to a business vision, which at its turn is linked both to a differentiation strategy and a development strategy. The key elements of the business model are linked to the two perspectives of strategy. In this representation, key resources are mainly responsible for customer value creation, whereas key processes are mainly responsible for shareholders value creation. It also shows that key processes are strongly influenced by key resources, and the development strategy is influenced by a differentiation strategy.

With the representation from Figure 1 in mind, decision makers would have better chances to assess the value of their business model by analyzing its quantitative and qualitative dimensions. In order to test the competitiveness of a given business model, the framework from Figure 2 is proposed.

According to the framework from Figure 2, a business model is competitive if the addressed need is more urgent than other needs, if the price for the value delivered is higher than the cost to produce and sell the re-

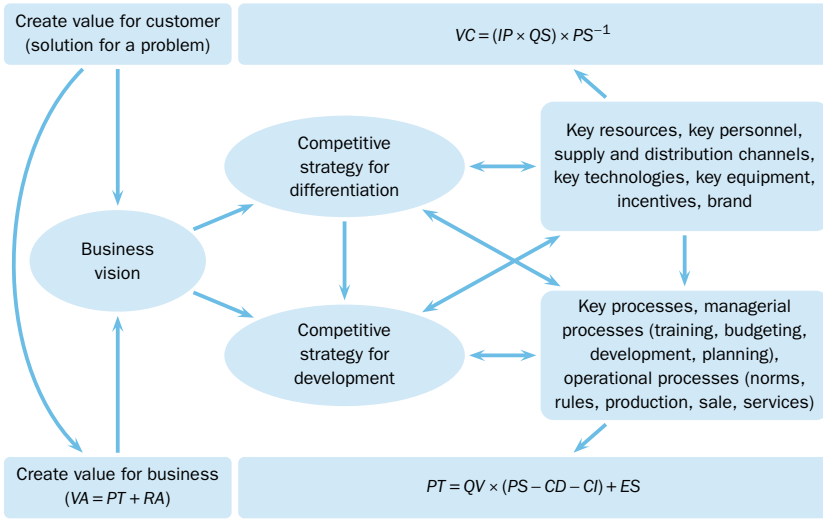

Figure 1 Business Model Conceptualization (VC – value for customer, IP – problem value weight, QS – quality solution, PS – price solution, PT – target profit, QV – sales volume, CD – unitary direct costs, ES – economies of scale, RA – return on assets)

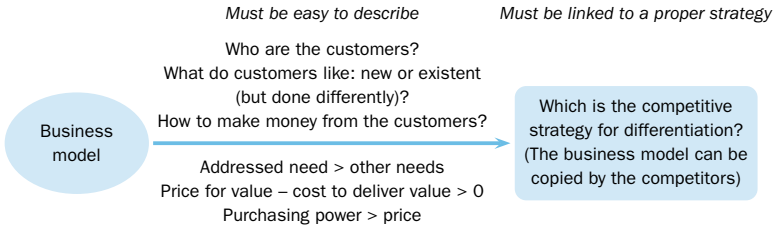

Figure 2 Framework for Testing Business Model Competitiveness

spective value, and the market segment has the economic potential to buy the value. In order to be effective, a business model should be simple and described in an easy way. However, to keep a longer term competitive advantage, a business model should be consolidated with a strategy that focuses resources and processes on becoming 'unique' in the market, where the synergies between the elements at operational level are the key ingredients for competitive protection.

Business Model Innovation

Scientific literature reveals many researches on business model innovation (Gambardella & McGahan, 2010; Zott, 2011; Baden-Fuller & Haefliger,

2013; Velu, 2015). Also, consulting companies promote plenty of roadmaps in this area. Innovation of business models is seen from various lenses. Because scholars do not agree on what a business model is, their researches on business model innovation are developed segregationally and in silos, thus being very difficult – if not impossible – to approach in a unitary way a critical analysis on the state-of-the art in this topic (Zott & Amit, 2010; Wirtz et al., 2010; Zott, 2011; Velu and Stiles, 2013). The same conclusion was reached by Schneider and Spieth after a systematic review of extant academic literature in the field of business model innovation (Schneider & Spieth, 2013). There are researchers that consider business model innovation as a trial-and-error approach (Sosna, Trevinyo-Rodriquez, & Velamuri, 2010). In resonance with this idea, researches done by Gassmann and his colleagues led to the conclusion that over 90% of current business model innovations are nothing else that recombinations of old models (Gassmann et al., 2014). They have identified 55 patterns of business model innovation, which are collected in a book as a source of inspiration for innovation in this area (Gassmann et al., 2014). Thus, instead of following a structured model for business model innovation, they propose as alternative the use of a library of models from where one can distinguish the best variant for the particular case. Other opinions are about the fact that technological innovation is the one that provides resources for business model innovation, thus companies must focus on the first type of innovation, whereas the second type will come up in a natural way (Calia, Guerrini, & Moura, 2007). These theories are not sustainable in all cases. A proof in this respect is the case of Nespresso (Matzler, Bailom, von den Eichen, & Kohler, 2013).

Consulting more references, this paper agrees with the position of Massa and Tucci that consider business model innovation a subset of business model design and reconfiguration (Massa & Tucci, 2013, p. 425). As this reference highlights, business model design deals with entrepreneurial choices on products-market mix, organizational processes and control systems, as well as the design of the boundaries for business, so as to link offerings to market. Business model reconfiguration is about extensive and complex innovations of the business model that require a systemic reconfiguration of existing technological and organizational capabilities. Usually, business model innovation follows after product innovation and process innovation over the life-cycle of market development (Massa & Tucci, 2013, p. 436). Business model innovation is usually necessary in times of instability or when dramatic structural changes in the market occur (Bouncken and Fredrich, 2016). According to Boston Consulting Group, business model innovation happens when two or more elements of the business model are transformed (re-thought, re-invented) at such levels that create more value to customers or the same value but in a different way (Lindgardt et al.,

2009, p. 2). This means that business model innovation does not imply creation of new technologies or brand-new markets. It focuses on delivering in a new way existing offerings, produced by existing technologies, to existing markets (Girota & Netessine, 2014). Thus, business model innovation consistently rethinks the current business around customer needs, followed by realignment of resources, processes and profit formula towards the new value proposition. In contrast with innovations that happen in technology, where most of them are incremental, business model innovation is in most of the cases radical and tends to produce disruption to the current business (Velu & Stiles, 2013; Velu, 2016). Therefore, the risk involved in business model innovation is high (Geissdoerfer, 2016, p. 1221). In this line, scholars like Henry Chesbrough and others highlight the fact that, even if companies may have intensive activities to explore new product ideas and technologies, they do not excel in terms of ability to innovate the business models that ground the paths through which offerings will pass (Chesbrough, 2010). Thus, a good balance between risk and returns in business model innovation is necessary. In this respect, knowledge management plays a crucial role in understanding where are the key priorities for rethinking business models (Malhotra, 2000, p. 4).

Beyond the debates around the meaning of business models, literature is still poor in methodologies for systematically leading innovation into business model reinvention. A highly mathematized formalism for business model innovation is proposed in a working paper from Harvard Business School, where business model is expressed under the form of profit functions (Casadesus-Masanell & Zhu, 2010). The formalism is based on the strategic innovation game theory. Even if it has some merits in terms of quantifying profitability for different options of the business model, it is very difficult to be understood by usual practitioners due to the abstract and hard mathematical formulations. Towards an empirical approach of business model innovation is the work of Johnson, Christensen and Kagermann. They do not necessarily provide a systematic framework to lead innovation, but instead formulate a set of items to check when a new business model is needed, as well as propose a set of areas where to look for innovations (Johnson et al., 2011). A combination of Case-Based Reasoning (CBR) and Theory of Inventive Problem Solving Method (TRIZ) (Altshuller, 2002) to support the innovation process of business model is proposed by Shao, Ding, Ding, and Liu (2012).

However, the approach is about adaptation of classical TRIZ to the field of business modelling and use of results under the form of a customized Contradiction Matrix (CM) to solve the conflicts identified within a given business model. Following the same stream is the research done by V. Souchkov, which uses a relationship diagram to visualize all links between

various elements in the building blocks of a business model canvas and, where conflicts are identified, TRIZ contradiction matrix is used to approach them (Souchkov, 2010). However, business model innovation is not only about conflict solving, as long as there are strong connections between business model, business strategy and influence factors, as diagram from Figure 1 highlights. A very recent research work about methodological approach of business model innovation is the one of Franca et al. (2016). Starting from the business model canvas of Osterwalder, Franca et al. propose a framework for strategic sustainable developed through which every block of the business model canvas is analyzed with respect to some sustainability criteria, and opportunities for innovation are identified. Without any critics on the value of this methodological framework, the challenge arises from the fact that it is only focused on bringing innovation into the business model from the narrower perspective of environmental sustainability. The current paper makes a step forward in this field of research and introduces a systematic roadmap for leading innovation within the process of business model reinvention.

A Systematic Roadmap for Business Model Innovation

The theory behind the roadmap proposed in this paper for business model innovation is that business models should evolve such as to reduce harmful functions or side effects in value proposition and to increase benefits, thus reaching closer levels to what are called ideal systems, where only benefits and no prejudices exist. In doing this, innovation must consider lessons from the past and must understand the major streams that made the business model to be as it is today. Evolution towards a superior form means better harmonization of the business model with the influence factors and attractors from its ecosystem (e.g., environmental, social, political, technological, economical, informational, etc.). This might require resolution of various conflicts. Solving conflicts without major compromises is seen as the right path towards business model innovation. However, an additional perspective has to be considered in the innovation process; that is, differentiation with respect to other similar businesses. In this respect, consideration of 'blue ocean' type business models is desirable. Building up such models requires supplementary efforts to innovate.

Directed Evolution

Directed evolution is mainly the prerogative of researchers in natural sciences, which try to mimic natural evolution in laboratory by acting at molecular level for diversification, selection and amplification. In this approach, the lack of detailed knowledge is compensated by the use of powerful screening and selection methods based on the concept of the 'survival of the

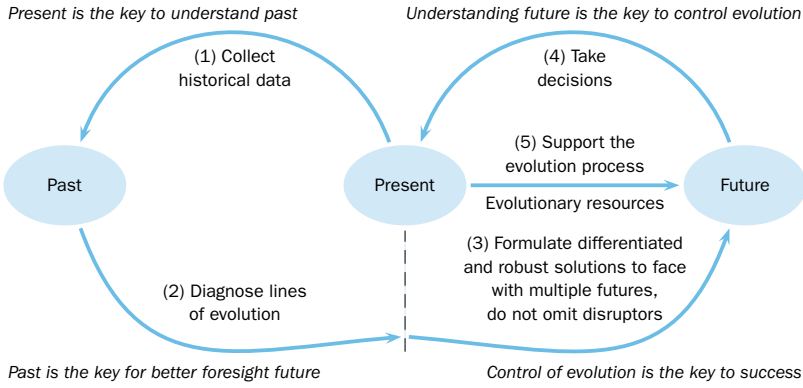

Figure 3 The General Rule of Directed Evolution (adapted from Zlotin & Zusman, 2004, p. 25)

fittest' (Dalby, 2011). However, directed evolution is a field of study in engineering, too. It deals with the laws of evolution of technical systems (Altshuller, 2002). Relevant contributions in this area are reported by scientists dealing with theory of inventive problem solving, where a reference work is (Zlotin & Zusman, 2004). Directed evolution considers several directions towards which a system can evolve, such as: better use of resources, deeper harmonization with other systems, higher integration into other systems, less harmful functions, more useful functions, more areas of applicability, higher autonomy, more efficiency at process level, closer to multi-level approach, less contradictions in the system, more dynamicity and controllability (Clarke, 2000; Zlotin & Zusman, 2004). The general rule of directed evolution is introduced in Figure 3.

According to the scheme in Figure 3, 'future' is influenced by 'past,' because 'present' is captured in a set of lines of evolution that are strongly embedded in the system and cannot be suddenly deviated very quickly. A practical tool for directed evolution is Nine Windows or System Operator Technique (Silverstein, Samuel, & DeCarlo 2013, pp. 125–130).

A Novel Architectural Construct for Business Model Innovation

In order to support business model innovation in a systematic way, researches from this paper led to a methodology that combines System Operator Technique (SOT) (Silverstein et al., 2013) with Blue Ocean Framework (BOF) (Kim & Mauborgne, 2005) and with a list of predefined areas of investigation (PAI) to identify major conflicts between the current business model and the future expected super-system (future influence factors), to which are added one or several tools of inventive problem solving (e.g. Contradiction Matrix (CM) (Altshuller, 2002), Ten Disruptive Rules Toolbox (TDRT)

(Brad, Mocan, Brad, & Mocan, 2015), Unified Structured Inventive Thinking (USIT) (Nakagawa, 2004), etc.).

The roadmap for business model innovation is presented in Figure 4 under a grid of Nine Windows (also called System Operator Technique), where the numbers in each box show the order for tackling issues within the innovation process. '*Past*' could be about a situation back in time with 5 to 10 years. '*Future*' means positioning 3 to 5 years forward. '*Present*' is about the current situation and/or expected very near future situation. '*System*' describes the business model at the block level (e.g., value for customer, value for business, business vision, differentiation strategy, development strategy, key resources, key processes), whereas '*sub-system*' is the description inside each block (details about the content of each block of the business model). '*Super-system*' describes the external environment and the context where business model exists, mainly by means of key influence factors.

'Patterns of evolution' are about the streams along which influence factors and business models have evolved from *past* to *present*, but also the estimates of future evolution of the influence factors. They are determined by collecting historical data and diagnosing the lines of evolution. 'Conflicts' occur at the intersection between the forecast future factors of influence and the current business model along the following Predefined Areas of Investigation (PAI): (1) Determinants leading to the development of the current business model that embed it in traditions; (2) Natural interdependencies that block the current model due to the concern of provoking instabilities; (3) Limitations that favour current consolidated mechanisms; (4) Strengths that intend to keep the status-quo. Blue Ocean Framework (BOF) analyzes the current business model at *system* level and formulates solutions in four directions: (1) Improve some strengths much above the peers; (2) Eliminate some weaknesses; (3) Lower some other weaknesses much below critical levels; (4) Add new features that make the model unique. To support the process of conflict resolution and 'blue ocean' creation, various tools for creativity and inventive problem solving can be used. This paper recommends three of them, such as: Contradiction Matrix (CM) (Altshuller, 2002), Ten Disruptive Rules Toolbox (TDRT) (Brad et al., 2015), and Unified Structured Inventive Thinking (USIT) (Nakagawa, 2004), etc.), but does not limit the pool of these tools. For example, some people might find enough to apply simple brainstorming tools.

Illustrative Example

To exemplify the methodology, a small size provider of project-based software development services (40 employees) located in an Eastern European country has been considered. The box *present-system* (see Figure 4) for the

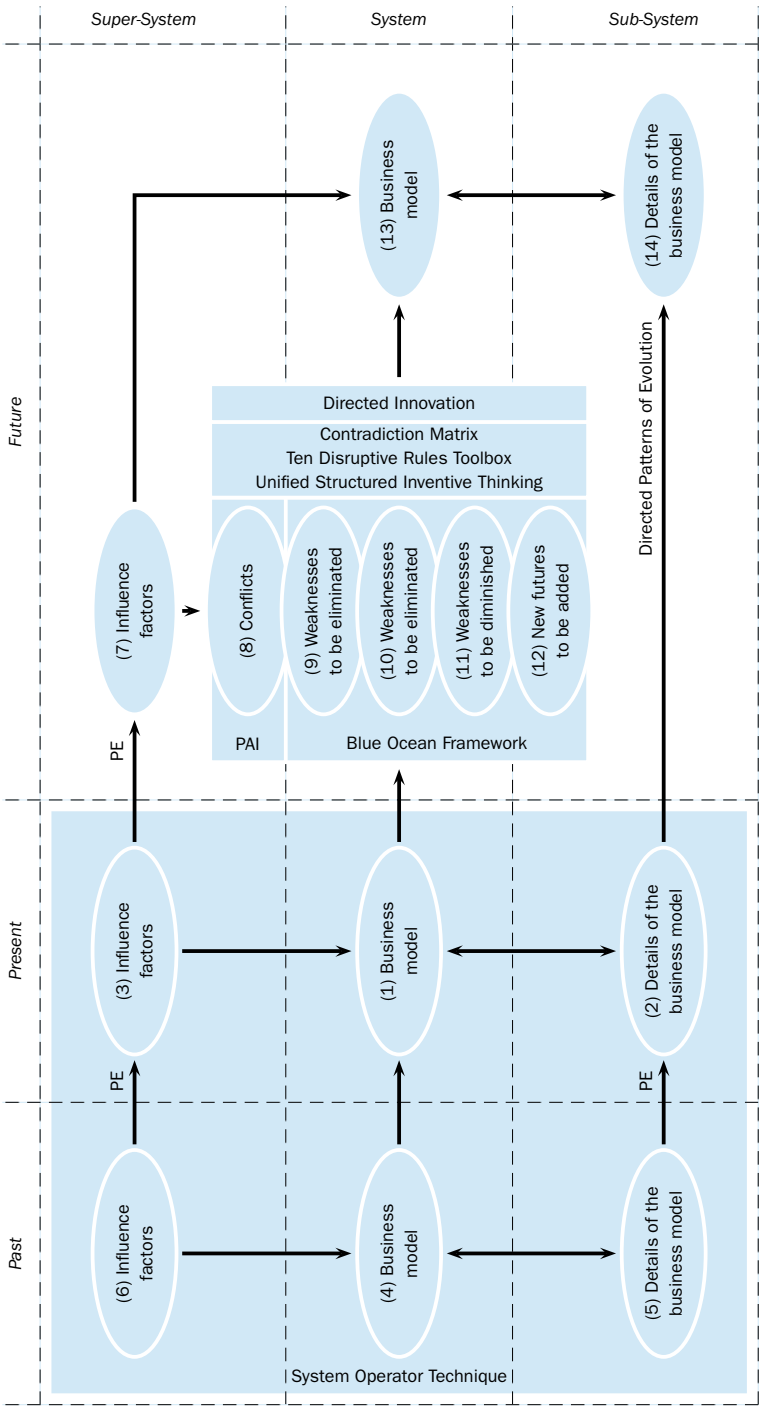

Figure 4 Roadmap to Directed Innovation of Business Models (PE – Patterns of Evolution, PAI – Predefined Areas of Investigation)

analyzed company is characterized by: (a) value for customer high quality services at lower costs; (b) value for business profit rate above 15% and revenue cycle below 60 days; (c) business vision sophisticated software services; (d) differentiation strategy high specialization on few business domains (not nominated in this paper); (e) development strategy more customers from different markets (not nominated in this paper) and longer term projects; (f) key processes software development; (g) key resources wide pool of highly skilled professionals. The box *present-sub-system* (see Figure 4) is mainly characterized by: (a) documented processes based on quality management standards (e.g., ISO 9001); (b) permanent training programs for employees; (c) structured and complete software development process based on a structured methodology (e.g. PRINCE 2); (d) clear communication procedures with customers and knowledge management supported by specialized software platforms; (e) quality cost management; (f) structured procedures and tools for project and product analysis, planning and optimization; (g) life-cycle approach of all projects, etc. The box *present-super-system* is characterized by the following crucial influence factors: (a) governmental incentives on professional human resources; (b) strong local, national and regional competition, with many competitors; (c) increasing rate of salary in a more accelerated way than man-day rate; (d) strong competition on human resources in the local market; (f) lower rate of new professionals than the required needs in the local market; (g) increasing rates of office spaces.

Past is positioned 15 years ago. The box *past-system* is characterized by: (a) value for customer good quality services at very low costs; (b) value for business profit rate above 20% and revenue cycle below 40 days; (c) business vision software development based on clear specifications; (d) differentiation strategy a bit lower prices than local competitors; (e) development strategy capturing any business opportunity; (f) key processes software development; (g) key resources core of highly skilled professionals. The box *past-sub-system* (see Figure 4) is mainly characterized by: (a) basic documentation of projects; (b) incident-based training of employees; (c) covering only some processes of the software projects (design, implementation, testing); (d) many iterations for bug-fixing, with extra-effort involved. The box *past-super-system* is characterized by the following major influence factors: (a) governmental incentives on professional human resources; (b) growing local and national competition; (c) growth rate of salary below the growth rate of man-day; (d) good accessibility of human resource; (e) attractive rates for office spaces.

The major patterns of evolution at *sub-system* level from *past* to *present* are: better use of resources (e.g., more specialized professionals), deeper harmonization with other systems (e.g., software development process),

higher integration into other systems (e.g., wider covering of software projects, including strategic planning, analysis, refactoring, maintenance, etc.), less harmful functions (e.g., reduction of poor quality costs), more useful functions (e.g., consolidation of strategic partnerships, higher sophistication of services), more efficiency at process level (e.g., optimized software development process, automated testing, wider pool of specialized professionals, specialization on fewer business application domains, etc.), more dynamicity (e.g., agile development process) and controllability (e.g., deeper integration with customer processes). The major patterns of evolution at *super-system* level from *past* to *present* are: more harmful functions (e.g., increasing local and national competition, increasing rates for office spaces, lowering ratio between salary rates and man-day rates, lowering labour productivity, etc.). *Future* is positioned 3 years from the *present.* The estimated patterns of evolution at *super-system* level from *present* to *future* are: (a) more harmful functions; (b) more dynamicity; (c) deeper harmonization with other systems. It is observed that most of the patterns are continuing from *past* to *future,* a fact that reflects the possibility of a crisis point in the future in relation with the sustainability of the current business model.

In conjunction with the expected patterns of evolution, future major influence factors will be: (a) increased influence of mobility; (b) more freelancers; (c) telework; (d) common legislation at European level; (e) governmental incentives for research activities; (f) increasing local, national and regional competition; (g) more development centres of multinational corporations in proximity; (h) continuation of depreciation of the ratio between man-day rate and salary rate. This evolution will impose at *sub-system* level the following directed patterns of evolution between *present* and *future:* (a) better use of resources; (b) higher integration into other systems; (c) more efficiency at process level; (d) closer to multi-level approach; (d) less contradictions in the system; (e) more dynamicity. Influence factors indicate the necessity to translate in the *future* from a project-oriented company to a product-oriented company. The question is how to do this with lower risks and higher impact.

With respect to the predefined areas of investigation, the first one is referring to the major determinants that keep the current business model embedded in local traditions. In this case, the lack of sufficient own venture capital to turn from a project company to a product company, inexperience on how to run a product-oriented company, as well as inexperience to attract large amount of external capital for developing and commercializing successful software products over long periods of time, are the major determinants for keeping the current business model. The second predefined area of investigation is about natural interdependencies that freeze the cur-

rent business model. In this case, they include the insufficiency of local and national venture funds and funding schemes for start-ups, the huge bureaucracy for attracting local funds, as well as the lack of resources to employ world-class experts on innovation. To these issues, some others are added, such as the cultural and historical patterns, which do not reflect a strong culture in product innovation in most of the national economic sectors. Looking at the third area of investigation – the limitations of the current business model – major issues are: lack or insufficiency of critical functions for product innovation and commercialization, such as marketing and sales functions, product documentation functions, as well as lack of R&D departments and IP management offices. The strengths that justify the preservation of the current model – which is the fourth area of investigation – consist of a mature and highly specialized software development process and a short revenue cycle.

A strong dependence of the business model from the influence factors can be seen from the information above. The crucial role of external factors on business model innovation is well-reflected by the roadmap from Figure 4. Business models can hardly evolve outside the so-called 'plausible possible,' which is dictated by the external influence factors. For example, a crucial element in this case study for turning business models from project-based to product-based is the existence of facile venturing schemes and innovation hubs at local level, with a critical mass of funds and a dynamics of investment as in the more advanced Western markets. Also, national programs that support innovation, as well as relevant governmental incentives for applied and experimental R&D would activate the transformation of the current business model. Many of these influence factors depend on national political will, as well as very probable on strategies regarding the flow and localization of big international venture capital (which are less visible).

With respect to the 'blue ocean' space creation, the first issue is about the current strengths that require higher valorization. In this case study, it is about: (1) use the increased efficiency of the software development process to allocate 10% of human resources on internal projects. The second issue is referring to weaknesses that require elimination. In this case study, actions are referring to: (1) develop a strategic alliance with a specialized partner on international marketing and sales (mainly for launching and commercialization of proprietary product-service systems); (2) set-up a mixed R&D team with a selected research group from a strong university. The third issue is about weaknesses that cannot be replaced so fast, but require significant reduction. The following action is proposed in relation with this case study: (1) use the high specialization in a given application domain to find a strategic customer for service provision with better chances to negotiate a more attractive man-day rate. The last issue is about new

features that might be added to increase differentiation. For this case study the following idea was elaborated: (1) focus on developing a proprietary software-hardware solution that targets a global market and whose value mainly stands in content and not in technology.

Combining the estimated *future* influence factors with the issues revealed in the four areas of investigation, the following major conflicts are revealed: (C1) 'need of a critical mass of local venture capital' versus 'limited possibilities/capabilities of the govern to create national venture funds and/or attract large international venture funds;' (C2) 'long revenue cycle' versus 'business risk;' (C3) 'highly specialized new organizational functions' versus 'low productivity of the current business model;' (C4) 'need a constant R&D activity' versus 'insufficient resources for development.'

In this case study, only the contradiction matrix (CM) was applied to tackle conflicts. Application of CM was supported by a software tool whose link is available at: http://193.226.17.76:8080/sts291-mvc/tool_cmx.do?aProject=1&aSet=1&aAct=1&aTarget=1&aActivityName=1. For the first conflict, the generic vectors of intervention dictated by CM are: (V1) reconfigurable construction by replacing hard parts of the system with others that can change their 'volume' or 'shape;' (V2) make the immobile part of the system mobile; (V3) make a transition from a homogeneous structure to a heterogeneous one. For the second conflict, the generic vectors of intervention suggested by CM are: (V4) use an intermediary system to do some actions; (V5) use a multi-level connection; (V6) increase segmentation for the system. For the third conflict, the generic vector of intervention is: (V7) replace a traditional system with a softer one. For the last major conflict, the generic vectors of intervention are: (V8) replace an expensive system with several inexpensive systems; (V9) change the degree of flexibility.

The set of generic vectors of intervention are analysed in the context of the company from the case study. Vector V1 suggests strategic partnerships for translating the business from project-based model to product-based model (or product-service system), where specialized partners to be involved in tasks that are not the core competence of the company (e.g., marketing, sales). Vector V2 highlights the need to involve a completed new management team for doing the transition, as long as the current management of the company is already captured in the actual business model. Vector V3 indicates the possibility of coexistence for a period of time of two business models, one following the development, introduction and growth phases of its life-cycle (i.e., the product-oriented model), while the other trying to extend the maturity phase of its life-cycle by increasing specialization and sophistication, as well as attraction of strategic customers (i.e., the project-oriented model). For translating to the new business model, a company shall be divided into two separate units, one of them adopt-

ing the new business model, while the other one prolonging the current business model as long as it is profitable, but infusing resources in the first one to increase its market viability, including the variant of cannibalization, too (see the case introduced by Velu and Stiles, 2013). Vector V4 also highlights the necessity to collaborate strategically with external entities (e.g. R&D, sales). Vector V5 requires to investigate the possibility of attracting a strategic investor in the new business model, one that is capable of facilitating the entrance in the new market using his network and possible his current customers. Vector V6 leads to the idea of developing a wider portfolio of auto-sustained product-service systems in the new business model such as to minimize business risk. Vector V7 reveals the idea of using more intensively a network of freelancers. Vector V8 suggests the possibility to even outsource some tasks for developing the product portfolio to companies that have the same profile as yours, but which are much cheaper than you are (e.g., because they are located in more cost-effective geographical regions, because they are in a different period of the life-cycle). The last vector, V9, indicates the openness for joint venture with other companies such as to save time and other resources for developing those modules in the new product-service portfolio, which are not the core know-how, but which are a necessary part of the overall assemble.

Conclusions

This paper has introduced a methodology for supporting business model innovation in a structured way. It is based on the thesis that external influence factors are the major drivers for business model innovation. In this respect, these factors and their patterns of evolution must be well-known and understood before starting any effort of innovation. In contrast with other methodologies for business model innovation, the methodology from this paper awards the primary attention to the conflicts that occur between the external influence factors and internal components of the business model, putting on the backward layer the internal conflicts. In fact, internal conflicts mostly influence business model's efficiency and not its effectiveness. But what mostly counts for business competitiveness is its effectiveness, which subordinates efficiency, too. Another new perspective displayed by the methodology is the relation between business strategy and business model innovation. A key role in the strategic agenda is the differentiated position of the business with respect to competitors and substitutes, which must be a key driver of innovation. A third paradigm of the methodology is the connectivity *past-present-future-sub-system-system-super-system*. From this perspective, innovation should not omit historically-embedded elements in the business model in order to increase the chances of success.

In order words, the 'plausible possible' should be taken into account for grounding the innovation process.

It would be nice if innovations happen firstly to the level of external influence factors, which are nothing else than the outputs of the *super-system.* However, this is outside the control capacity of the company, except in the case when cluster associations are capable of creating effective bottom-up pressures on policy makers. The connectivity of the *system* with the *super-system* is an essential element for guiding the innovation process. Thus, an important issue is to identify the business model of the *super-system* and to act smartly on it for directing its evolution. For example, in the illustrative case study in the paper, most of the limitations of the current business model are dictated by the poor outputs in the *super-system.* Because, at a given moment in time, the outputs of the *super-system* are 'frozen,' the single chance for business model innovation is to approach in a smart way the conflicts these outputs generate in the *system* and further to try making a difference in the given competition environment.

Other important finding of this research is the fact that those ecosystems capable of generating healthier influence factors will provide stronger competitive advantages for their constitutive systems (e.g., business entities). Considering the case study, it is somehow clear that the national conditions are not any more favourable for continuing long time with ITO/KTO services.

The innovation framework of business models proposed in this paper is still incomplete in several aspects. It does not provide a mean for measuring the efficiency and effectiveness of the outputs in the innovation process. Any new innovation generates disturbances in the internal processes and the global balance is not yet assessed. A new concept called 'optimized business model innovation' has to be investigated in future researches. Another limitation of the proposed methodology is the fact that it does not entirely explore the wider space of manifestation suggested by Figure 1. But, it could represent an opportunity for future researches. Also, the evolutionary resources are not considered by the current methodology and no element was mentioned on how this type of resources should be built in a synergetic way with the business model innovation.

More researches between strategy innovation and business model innovation are necessary to better reflect the true potential of innovation at business model level. Also, simultaneous innovation of sub-system, system and super-system under the form of hyper-system or system of systems would reveal new facets that deserve supplementary researches. A meta-model formulation that comprises previous silos-based contributions in the professional literature of business model innovation could be another future area of investigation. Researches that combine methodologies of product innovation with business model innovation should also not be neglected.

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Designing a Programme Profile: An Example of a Bachelor Business Study Programme

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In this paper, we address the issue of developing a study programme profile, by which the competencies and learning outcomes at the level of a study programme are systematically related to the competencies and learning outcomes at the level of a course. We describe a model of designing a programme profile for a particular bachelor's study programme in the field of business. Our approach adopts concepts of general and specific competencies designated from the Tuning project to link learning outcomes at the course level with the learning outcomes at the programme level with involvement of all the relevant stakeholders by using a triangulation technique (involving the students, employers and teachers). The results elaborate a clearer picture of programme characteristics with precisely defined key competencies and learning outcomes linked with the study courses, as well as a clearer description of the employment potential.

Keywords: programme profile, competency, learning outcomes, Slovenia, syllabi

Introduction

The European higher education area (EHEA) comprises countries with different academic traditions, cultural and political backgrounds that have agreed to cooperation and shared commitments (*Yerevan Communiqué,* 2015). Teaching and learning have gained considerable attention in the policy discourse of the Bologna process ever since the key policy-makers (such as European Commission (EC) and OECD) began to perceive higher education in the utilitarian and economic view, driven by globalisation (Sin, 2015). A new pedagogical model of student-centred learning and teaching plays a significant role in the design and delivery of the study programmes. In many cases, it is at the core of higher education institutions' (HEIs) teaching missions (*Standards and Guidelines for Quality Assurance in the European Higher Education Area,* 2015, p. 11–12). The primary challenge for HEIs is to revise the existing study programmes and align them with the Bologna 'action lines' (*Bologna Declaration,* 1999, p. 3–4; Eurydice, 2012, p. 16)

by (a) adopting common and comparable degree systems, (b) utilizing a cycle structure, (c) establishing European Credit Transfer and Accumulation System (ECTS), (d) promoting mobility, (e) fostering cooperation in quality assurance, (f) developing national qualification frameworks, (g) encouraging lifelong learning, (h) employability and (i) social dimension to meet the changing needs of the economy and society.

The implementation of the three-cycle structure has set the challenge for HEIs to redesign the 'old' study programmes in accordance with the Bologna requirements. The most important aspect of the implementation of ECTS credits presents a link between the student workload and the expected learning outcomes (*ECTS User's Guide,* 2015). While the ECTS has been used as a transfer and accumulation system, the Bologna process implementation report stated that the 'most difficult issue was to link all the programme (educational) components with learning outcomes' (Eurydice, 2012, p. 47). Until 2012, there were only 19 higher education systems that had linked all the programme components with the learning outcomes. The 2015 Bologna report, however, stated that HEIs in 22 European higher education systems had connected all the study programmes' components with the learning outcomes (Eurydice, 2015, p. 71).

In this paper, we are addressing the question of how to develop a programme Profile in the case in which competencies and learning outcomes at the level of the programme are systematically linked to competencies and learning outcomes at the level of a course. We describe the development of a model connecting the programme components on the example of a bachelor's degree programme in the field of business studies (ISCED 34) Business in Contemporary Society. The first cycle programme aims to equip students with the knowledge and skills to make them employable. Therefore, we followed the *ECTS User's Guide's* (2015) recommendations by involving all the relevant stakeholders in designing a programme profile for the particular study programme. Our proposed model is drawn from the findings of the Tuning project (see http://www.unideusto.org/tuningeu/home.html) and adjusted to the Slovenian context and the study programme specifics.

In the paper, we firstly present literature review focusing on the components of the programme profile namely the learning outcomes and competencies as the major building blocks of the programme. Secondly, the proposed methodology for developing a programme profile and an example of a programme profile is presented. Finally, in the concluding remarks, implications for practice and theory are summarised.

Literature Review

The introduction of the EHEA has brought upon a rationale to restructure the description of the degree programmes especially regarding learning out-

comes (Gibbs, Kennedy, & Vickers, 2012). The *ECTS User's Guide* (2015) defines an educational programme as 'a set of educational components – based on learning outcomes – that are recognised for the award of a qualification.' *Educational components* may be course units, modules, other types of course units, work and clinical placements, research work, laboratory work, and other learning activities (such as tutoring or mentoring) that carry ECTS credits.

There are many different names of the programme characteristics that provide core information about the programme; for instance, programme profile (*ECTS User's Guide,* 2015), degree programme profile (Gibbs et al., 2012; Lockhoff et al., 2010), curriculum profile (Mesquita, Lima, Flores, Marinho-Araujo, & Rabelo, 2015), competency profile (Uhlenbrook & de Jong, 2012), etc. The programme profile provides the most relevant results of teaching and learning and represents an 'essential tool for communication, transparency and recognition' (Lockhoff et al., 2010, p. 20). The main elements of the programme profile should be learning outcomes, generic and specific competencies and the information about the employability potential (Lockhoff et al., 2010, p. 20). Following this guidelines, we have developed a model to design a graduate programme profile aiming to support clear information on the study programme with programme learning outcomes, key competencies and information of the career path. Some similar exemplars were also presented in the *ECTS User's Guide* (2015, p. 92) describing programme profiles or a single course unit using the learning outcomes technique.

Learning Outcomes

Learning outcomes are a highly debated concept in the EHEA. The common focus on the learning outcomes is present since the very beginning of the Bologna process. Even though *Bologna Declaration* (1999) and *Prague Communique* (2001) do not even mention the learning outcomes (Adams, 2008, p. 4), the concept of learning outcomes has gained an increased attention ever since the Berlin communique in 2003. Since then, a considerable importance was given to properly understanding, implementing and promoting the learning outcomes throughout the structural reforms. Adams (2008, p. 5) identified a substantial shift in European higher education from input factors (such as study duration, location, pedagogical content) towards the concept of learning outcomes, as well as the abilities (i.e. competencies), a graduate achieves by the end of the study. More recently, the 2015 Ministerial Conference and Fourth Bologna Policy Forum in Yerevan (2015) once again highlighted the importance of 'transparent descriptions of learning outcomes' (*Yerevan Communique,* 2015, p. 2). In the accompanying document the Structural Reforms Working Group (2014, p. 4) stated that

much attention should be given to the quality and relevance of learning, because:

> [...] the ultimate aim is to equip graduates with the knowledge and understanding and the essential skills and competencies for personal, societal, and professional success in today's world. Therefore the curriculum and learning outcomes are at the center of structural reforms.

On the other hand, European Guidelines and Standards (2015) have set the priority to implement the *intended* learning outcomes to design quality study programmes. For example, the 1.2 standard of internal quality assurance focusses on the development and approval of programmes that should 'meet the objectives set for them, including the intended learning outcomes' (EGS, 2015, p. 11).

Also, clearly defined learning outcomes are at the core of developing a student-centred learning[1] (see Standard 1.3) with emphasis on the outcome-based approach. Among EHEA countries, 40 countries in which steering documents are addressing the student-centred learning scored the learning outcomes and the assessment based on learning outcomes to be the most important element (Eurydice, 2015, p. 73). Although the understanding of the learning outcomes varies from country to country, several Bologna actions depend on successful implementation of learning outcomes (qualification frameworks, credit transfer, lifelong learning, provision of a precise information about the programme, strengthening of the links to the labour market and employment, advancement of recognition of prior learning, introducing student-centred learning, internal quality assurance, etc.) (Eurydice, 2012; Adams, 2008, p. 6).

The ongoing curricular reform, including the implementation of ECTS as another Bologna tool, assigned the learning outcomes a central role (Adams, 2008, p. 8). The ECTS system was introduced as a link between student's workload and learning outcomes to help to develop or restructure a study programme and its components (*ECTS Users' Guide,* 2015, p. 24–25). The learning outcome approach has been successfully implemented in the European Qualifications Framework, as well as in national qualification frameworks, but its implementation in the area of learning and teaching still lags behind (European Commission, 2013, p. 35). Similar findings were reported in the 2015 Bologna implementation report (Eurydice, 2015).

Several reports and practical guidelines have addressed the issue on how to write learning outcomes, as well as how to implement the intended (or desired) learning outcomes at programme and study course level. Among them, Kennedy (2007) has addressed this issue in a practical handbook *Writing and Using Learning Outcomes.* Bologna expert Adams (2008) identified good and bad practices in creating and implementing learning outcomes

in the report *Learning Outcomes Current Developments in Europe.* Moreover, the Tuning project and its report *A Tuning Guide to Formulating Degree Programme Profiles: Including Programme Competencies and Programme Learning Outcomes* (Lockhoff et al., 2010) also highlighted the link between competencies and learning outcomes.

Relation between Learning Outcomes and Competencies

Competencies and learning outcomes of a study programme or programme component (e.g., course unit, module, work placement) are very differently understood in EHEA countries leading to confusion and misuse of both terms. The fuzzy relationship between competencies and learning outcomes makes it even harder to distinguish between these two concepts. Learning outcomes are most frequently defined as 'statements of what the individual knows, understands and can do on completion of a learning process' (*ECTS Users' Guide,* 2015, p. 10). A similar definition was also used by other authors (see Kennedy, 2007) as well as in the Tuning project. The Tuning definition also includes the argument that 'learning outcomes specify the requirements for the award of credits' (see http://www.unideusto.org/tuningeu/competences.html). The conclusions stemming from the various definitions are the same: (a) learning outcomes are student-centred, and (b) learning outcomes focus on the result of teaching and learning activity (Kennedy, 2007). Furthermore, a learning outcome has to be a measurable achievement arising out of a learning experience. Therefore the 'active verbs' are a necessary element to include in the learning outcome statements.

While a competency on the other hand 'is a quality, ability, capacity or skill that is developed by and that belongs to the student' (Lokhoff et al., 2010, p. 21). In the *ECTS User's Guide* (2015), a competency was defined as 'the proven ability to use knowledge, skills and personal, social or methodological abilities, in work or study situations and professional and personal development.' Furthermore, in the Tuning project (see http://www.unideusto.org/tuningeu/competences.html) the competencies:

> [...] represent a dynamic combination of knowledge, understanding, skills and abilities. Fostering competencies are the object of educational programmes. Competencies will be formed in various course units and assessed at different stages [...]

In some contexts, the term key competencies is used. In the EC report *Rethinking Education: Investing in Skills for Better Socio-Economic Outcomes* key competencies are defined as 'a combination of knowledge, skills and attitudes appropriate to a specific context' (European Commission, 2012, p. 6). Due to several definitions of competencies, Kennedy, Hyland, and Ryan

(2009) and Gibbs et al. (2012) pointed out the fuzziness of this concept and urged for a careful use. They recommended defining a clearer meaning of the term competencies, apparently to avoid the confounding effect.

In the Slovenian Higher Education Act (Zakon o spremembah in dopolnitvah Zakona o visokem šolstvu (ZViS-J), 2014), study programmes are described with objectives or generic and subject-specific competencies (Article 35a). Therefore, the Slovenian Agency for Quality Assurance prescribed a concrete form for planning a course unit with not just clearly stated learning outcomes, but also generic and subject-specific competencies that need to be achieved by the end of the course unit. The Slovenian Qualification Framework adopted the European Qualification Framework definition of competency as 'the ability to use knowledge, skills and personal, social and methodological abilities in the educational, professional and personal situations.' Competencies are further divided into generic and subject-specific (occupational) ones.

The Tuning project that was launched in 2000 to help universities to implement Bologna requirements focused on the 'tuning' of the educational structures and programmes in EHEA. In this project, an attempt was made to link learning outcomes to the competencies (Lockhoff et al., 2010). Gibbs et al. (2012) provided several arguments why they disagree with Tuning definitions and with linking the learning outcomes to the competencies. Firstly, the blurriness of the term competency makes it impossible to 'define learning outcomes in terms of competency' (p. 79). Secondly, the competency cannot be assessed in the same way as learning outcomes and, lastly, the learning outcomes are an entirely independent concept from the competency concept (Gibbs et al., 2012, p. 80). Despite this critique, we have adopted the Tuning project definition of the learning outcome as 'the level of competency attained by the student and verified by assessment' (Lockhoff et. al., 2010, p. 55; *ECTS User's Guide,* 2015, p. 22). The latter means that a student can achieve a competency to a certain level or extent through achievement of a measurable learning outcome. This kind of a link between learning outcomes and competencies enables HEIs to assess the students' progress whether they have developed the required competencies of the programme or not (Lokhoff et al., 2010, p. 21). In our paper, we adopt the described definition of learning outcomes. By doing so, we can clearly link them with the competencies.

Moreover, the outcome-based approach needs to be supported by the collaboration with all the relevant stakeholders. The Modernisation of Higher Education Report (European Commission, 2013, p. 42) also calls upon a constant dialogue among all involving stakeholders to improve the study programmes. Therefore, our approach included all the key stakeholders – students, employers and higher education teachers.

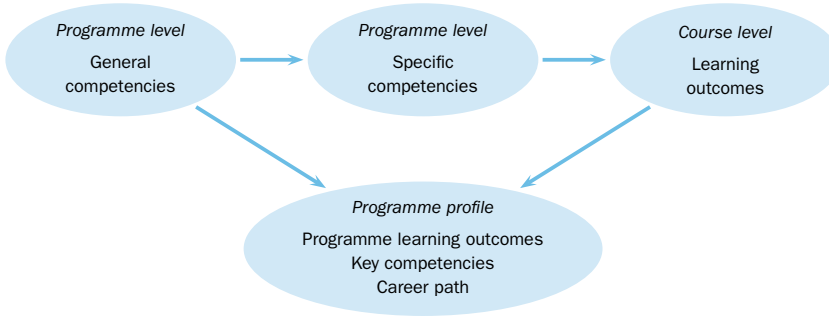

Figure 1 Steps to Design a Programme Profile

A Model to Design a Programme Profile

Based on the literature review, we created a model to design a programme profile. In the model, we include several steps by which the study programme might be improved. The steps can be summarised as follows (see Figure 1):

1. Adopting a proposed list of generic and subject-specific competencies for business studies.
2. Revising the competencies of the study programme.
3. Adding the competencies that are unique to the study programme.
4. Linking the competencies at the programme level with the competencies and learning outcomes at the course level.
5. Establishing a programme profile with aligned competencies and learning outcomes at a course level as well as a programme level.

A similar attempt to develop a programme profile step by step was made for the Industrial Engineering and Management programme, applying competencies and knowledge areas (Mesquita et al., 2015). They proposed a framework of competencies with the characterisation of programme's knowledge areas, defining competencies based on 'mobilisation' of resources in specific contexts, validating the competencies and applying the framework in the programme's curriculum. However, in their paper, they do not distinguish between learning outcomes and competencies. Our proposed model, on the other hand, focuses directly on the relations between learning outcomes and competencies.

Methodology to Develop a Programme Profile

We started the revision of the study programme Business in Contemporary Society with a profound desk research focussing on relevant literature on competencies and learning outcomes. The aim was to renew and improve

Table 1 List of Generic Competencies

GEN1: Working with data and information
GEN2: Basic computer skills
GEN3: Interpersonal, social skills
GEN4: Cooperation, teamwork, group work
GEN5: Leadership skills
GEN6: Ethics
GEN7: Diversity and multi-cultural skills
GEN8: Critical thinking
GEN9: Creativity
GEN10: Initiative and entrepreneurial skills
GEN11: Organising and planning skills
GEN12: Verbal communication skills
GEN13: Written communication skills
GEN14: Communication in a foreign language

the competencies at the programme level. The result of the desk research was the adoption of competencies for students studying business developed in the context of the Tuning project.

Altogether 12 general competencies and 15 specific competencies were selected appropriately to describe the study programme Business in Contemporary Society. Next, we tested the chosen competencies by involving all the relevant stakeholders in discussion with the use of triangulation technique:

- Students with an on-line questionnaire and a focus group of 5 students.
- Employers with an on-line questionnaire and group discussion on the survey result with seven representatives of employers.
- Teachers with a workshop discussing the results of the surveys among students and employers.

As indicated, the on-line questionnaire survey was conducted among students and employers. Students were asked to rate (using a Likert scale from 1 – very low to 5 – very high) to what extent they had acquired general and specific competencies during their studies. On the another hand, the employers were asked to rate to what extent the competencies were required for work performance. After the survey, two meetings (focus groups and group interview) were organised, one with students and one with employers. At the meetings, the survey results were explained to the participants and discussed. The aim of the meetings was to assess the extent the survey results were adequate for the study programme Business in Contemporary Society and to obtain additional thoughts or recommendations. The final

Table 2 List of Specific Competencies

SPEC1: Organisations' characteristics, functional areas and the relationships between them
SPEC2: Organisational audit, problems and challenges in business, problem-solving, consultancy plans
SPEC3: Macro- and microeconomic elements and their impact on an organisation
SPEC4: Methods and tools for analysis of an organisation and its environment to identify perspectives
SPEC5: Managing a company by planning and controlling by use concepts, methods and tools
SPEC6: Accounting and finance systems
SPEC7: Change management
SPEC8: Culture and its influence in the field of the course
SPEC9: Principles of ethics
SPEC10: Law in the field of the course
SPEC11: Psychology in the field of the course
SPEC12: Information systems and software in the field of the course
SPEC13: Engineering and technology in the field of the course
SPEC14: Foreign language in the field of the course
SPEC15: Social and environmental responsibility in the field of the course
SPEC16: Research methodology in the field of the course
SPEC17: Mathematics and statistics in the field of the course
SPEC18: General overview of the course content area

list of competencies was then formulated with altogether 14 generic and 18 specific competencies (see Table 1 and Table 2).

Having the collected data in mind, we held a workshop for teachers on the topic of 'How to Revise a Study Course Syllabi.' Teachers were asked to align the content of their courses with the competencies of the study programme. The workshop started with the conceptualisation and presentation of the competencies and learning outcomes definitions, followed by a presentation of the findings stemming from the students' and employers' surveys. In the second part of the workshop, teachers were asked to revise the syllabus of one course in accordance with the general and specific competencies. In the next step, they had to write the intended learning outcomes of the course unit in relation to a specific competency. Each identified specific competency was linked to up to three learning outcomes, expressed with the use of active verbs based on the Bloom's taxonomy. After the workshop, the teachers were invited to revise the existing course syllabuses supported by e-forms and in accordance with the exercise delivered at the workshop. In Table 3, there is an example of a course syllabus for the course unit Business Creation and Growth of Enterprises.

After all course syllabi had been updated and revised, a synthesis of

Table 3 Example of the Course Syllabus content: Business Creation and Growth of Enterprises

General competencies	Specific competencies	Learning outcomes
GEN4: Cooperation, teamwork, group work; GEN8: Critical thinking; GEN9: Creativity; GEN11: Organizing and planning skills; GEN12: Verbal communication skills (e.g. rhetorics, presentation skills); GEN13: Written communication skills	SPEC1: Organizations' characteristics, functional areas and the relationships between them	(1) Knows operation of small businesses in terms of the relationships between the different functional areas and processes that take place within the company and between the company and the external environment.
	SPEC2: Organizational audit, problems and challenges in business, problem-solving, consultancy plans	(2) Knows and understands the business operation in different business contexts. (3) Knows the areas of entrepreneurial consultancy and the need for it. Knows how to approach the creation and planning of entrepreneurial ideas.
	SPEC4: Methods and tools for analysis of an organization and its environment to identify perspectives	(4) Knows operation of entrepreneurial and innovative supportive environment in Slovenia. (5) Uses the selected tool to analyse the internal and external environment of a company in case of smaller firms (PEST, SWOT, Porter's value chain, etc.).
	SPEC5: Managing a company by planning and controlling by use concepts, methods and tools	(6) Knows the content related to the creation of companies, business planning and management of a company and the human resource management. (7) Evaluates leadership styles in a smaller company and their impact on interpersonal relationships and the success of small businesses.
	SPEC11: Psychology in the field of the course	(8) Analyzes the personal characteristics of an entrepreneur and their impact on business activities.

the general and specific competencies (see Figure 2), as well as learning outcomes at a course level, was carried out. The result of this synthesis was the identification of the programme key competencies and accompanied learning outcomes of the study programme that constituted a programme profile for Business in Contemporary Society (see Table 4).

From Figure 2, it is clear that most course units are focused on critical thinking (GEN8), followed by Creativity (GEN9), Organizing and Planning (GEN11), Working with data and information (GEN1). Moreover, the prevailing specific competencies were General overview (SPEC 18), Organisational audit, problems and challenges in business, problem-solving, and consultancy plans (SPEC2) and Methods and tools for analysis of an organisation and its environment to identify perspectives (SPEC4).

The programme profile was then constructed based on learning outcomes identified with specific competencies (Table 4).

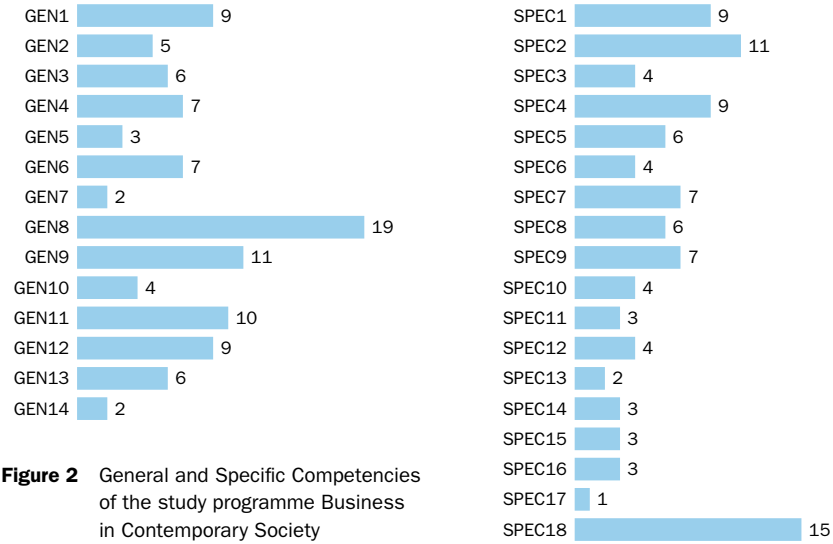

Figure 2 General and Specific Competencies of the study programme Business in Contemporary Society

Table 4 Programme Profile for Study Programme Business in Contemporary Society

Programme learning outcomes	A graduate is capable of planning, organizing, implementing and monitoring activities in all areas of business. They know how to find solutions to business problems by using data and IT tools, as well as simpler methods of analysis, e.g., accounting analysis, analysis of business finances and financial markets, marketing mix, international trade and international legislation. They are familiar with accounting reporting and the basics of financial and cash flow. They identify possible options for entering new markets, understand marketing problems and recognise how a trademark can influence the success of a company. They are also familiar with methods of assessing the competencies of employees and understand the ethical approaches to resolving conflicts between employees.
Key competencies	*Critical thinking.* A graduate can critically think and analyze activities within an organization, the economy or in general. With this, they can put themselves in the role of company management, employees and consumer. *Creating new ideas.* A BCS graduate can create solutions to business problems by using critical thinking. They can also independently design graphic and multimedia content. *Organizing and planning.* Knows how to build a business plan. *Working with data and information.* Independently finds suitable sources of data, information and knowledge. Can recognise IT tools and programmes to implement business research and analysis.
Career path	A graduate can fulfil a job position that demands business, as well as economic and other knowledge that requires an understanding of the business environment and management of business processes or functions such as HR, finance, purchasing, sales, marketing, accounting, etc. The professional knowledge received enables them employment in economic and non-economic sectors, state management or different non-profit organisations in the public sector.

Discussion and Conclusion

This paper addresses the issue of how to establish a programme profile for a business study programme with the focus on linking programme competencies and learning outcomes with those at the course level. The proposed model to design a programme profile reflects a output-based approach, which is at the core of the European higher education policy, with considerable emphasis on the learning outcomes. The proposed programme profile enables precise information to student candidates and employers leading to a stronger and responsive link between the study programme and market. It is also in line with the Bologna recommendations.

Our approach adopts general and specific competencies from the Tuning project to link learning outcomes at the course level with the intended learning outcomes at the programme level involving all relevant stakeholders with a triangulation technique (students, employers and higher education teachers). The outcome of this systematic approach is the renewal of the course units' contents for the whole study programme Business in Contemporary Society, focussed on student-centred learning. The Bologna Implementation Report (Eurydice, 2015, p. 72) stated that more time is needed to implement the learning outcomes successfully, and it includes a change in the paradigm from a teacher- to a student-centred teaching. With our approach, the teachers are forced to make a change in their attitudes towards teaching and especially in the first phase of the teaching and learning process – the planning of a course unit. The result should be a clear overview of the study programme's main 'strengths' and 'weaknesses,' as well as clearly defined programme key competencies and learning outcomes that are linked to the course units signalling valuable information to both, students and employers.

Notes

1. Student-centred learning (SCL) is defined as 'a process of qualitative transformation for students and other learners in a learning enviorment, aimed at enhancing their autonomy and critical ability' with the following elements: (a) reliance on active lerning; (b) emphasis on critical and analitical learning; (c) increased responsibility and accountability on the part of the student; (d) increased authonomy of the student; (e) reflective approach (*ECTS User's Guide,* 2015, p. 15).

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Abstracts in Slovene

Vidiki ustvarjanja znanja v LAB studio modelu

Kari-Pekka Heikkinen in Teppo Räisänen

Visokošolske organizacije se nenehno spreminjajo. Univerze, šole, zasebne šole in spletne univerze izpopolnjujejo svoje pedagoške metode in učne modele na konkurenčnem trgu. Članek skuša odgovoriti na vprašanje, ali eden izmed teh modelov študentom pomaga pri pridobivanju novih znanj. V njem je predstavljena študija LAB studio modela (LSM). Gre za pedagoški model, ki vzpostavlja povezave med problemi, ki so povezani s poklicnim življenjem in priznavanjem ter razvojem poslovnih prototipov in start-up podjetij. Teoretična osnova LSM temelji na konstruktivističnem pogledu na učenje, katerega jedro je v projektnem izobraževanju. Ključni cilj LSM je podajanje podjetniških kompetenc na področju visokega šolstva. Na podlagi študije primera, ki vključuje pregled literature na temo ustvarjanja znanja in rezultate vprašalnika, kvalitativni rezultati analize kažejo, da LSM predstavlja obetavno podporno orodje za ustvarjanje znanja. Na podlagi rezultatov raziskave smo prišli do zaključka, da je LSM uporaben predvsem kot podpora za različne procese modela SECI, kot sta socializacija in internalizacija, obenem pa je videti, da podpira tudi organizacijske vidike ustvarjanja znanja.

Ključne besede: LAB studio model, interdisciplinarno izobraževanje, ustvarjanje znanja, visoko šolstvo, model SECI

IJMKL, 5(1), 5–22

Pomen odnosa do znanja in inovativnosti za delovanje proizvodnih podjetij v lokalnem ali mednarodnem okolju

Marcin Soniewicki

Ukrepi za upravljanje znanja in inovacijski procesi so v današnjem svetu zelo specifična in kompleksna tematika. Zato se pričujoči članek osredotoča na ozek vidik teh vprašanj, oziroma na način, kako to tematiko dojemajo proizvodna podjetja. Članek analizira in primerja odnos proizvodnih podjetjih, ki delujejo v lokalnem in mednarodnem okviru, do upravljanja znanja in inovacij. Analizira tudi vpliv različnih pristopov k predmetu raziskave na ustvarjanje konkurenčne prednosti omenjenih podjetij. Empirična raziskava, v kateri je sodelovalo 331 podjetij, je pokazala, da podjetja na mednarodnem trgu pripisujejo večjo vrednost upravljanju znanja in inovacijam kot njihovi kolegi, ki delujejo le na lokalnih trgih. Rezultati raziskave so pokazali tudi, da imajo podjetja, v katerih se vodilni delavci in zaposleni zavedajo pomena znanja in inovacij, pomembno konkurenčno prednost pred ostalimi. To velja za vse vrste proizvodnih podjetij. Velja pravilo, da več kot podjetje sodeluje v mednarodnih

operacijah, večjo pozornost bi moralo posvečati procesom znanja in inovacij. Tega bi se morala zavedati vsa podjetja, ki delujejo tujih trgih.

Ključne besede: znanje, upravljanje znanja, inovacije, proizvodnja, internacionalizacija, konkurenčna prednost, konkurenčnost

IJMKL, 5(1), 23–36

Upravljanje s tehničnimi inovacijami s pomočjo pravic tehnične lastnine

Michael Horeth

Izraz inovacija se uporablja v mnogih kontekstih in se je postopno razvijal v zadnjih desetletjih. Članek se osredotoča predvsem na upravljanje s tehničnimi inovacijami in tovrstne inovacije loči od drugih. Med možnimi načini za upravljanje s tehničnimi inovacijami, so izpostavljene pravice tehnične lastnine, patenti in uporabni modeli. Poleg mehanizma poslovne skrivnosti so takšni načini pravne zaščite tehničnega znanja podjetja zelo dragoceno orodje za upravljanje in komercializacijo inovacij, glede na prehod iz zaprtih inovacij na občutno bolj odprte inovacije. Članek obravnava uporabnost ukrepov pravne zaščite pri upravljanju s tehničnimi inovacijami in vsebuje kritično oceno.

Ključne besede: upravljanje inovacij, pravice tehnične lastnine, patent, uporaben model, tehnične inovacije, odprta inovativnost, omejitve pravic tehnične zaščite

IJMKL, 5(1), 37–56

Analiza percepcij o ustvarjanju znanja: vloga organizacijskega znanja in tržnega okolja

Khalid Abdul Wahid, Haruthai Numprasertchai, Yuraporn Sudharatna in Tipparat Laohavichien

Namen te študije je raziskati vpliv dejavnikov organizacijskega znanja in dejavnikov tržnega znanja na ustvarjanje znanja v inovativnih podjetjih na Tajskem. Med inovativna tajska podjetja, ki so registrirana pri tajski Nacionalni agenciji za inovacije (NIA), smo razdelili 464 vprašalnikov. Od teh smo dobili nazaj 217 vprašalnikov. Za določitev učinka dveh sklopov virov za ustvarjanje znanja smo uporabili metodo modeliranja strukturnih enačb (angl. Structural Equation Modeling – SEM): organizacijsko znanje (družbena interakcija, organizacijske rutine in informacijski sistem) in poznavanje trga (usmerjenost k strankam, usmerjenost h konkurenci in usmerjenost k dobavitelju) za ustvarjanje znanja (rezultat izdelka in rezultat storitev, rezultat procesa in tržni izid). Rezultati so pokazali, da je poglavitno gonilo ustvarjanja znanja povezovanje organizacijskega znanja in tržnega znanja. Ugotovitve kažejo tudi na to, da sta družbena interakcija in usmerjenost k strankam najpomembnejša dejavnika pri napovedovanju ustvarjanja znanja. Študija prinaša empirično analizo vloge

različnih virov znanja v procesu ustvarjanja znanja v MSP in njihovega vpliva na rezultat inovativnega znanja podjetij.

Ključne besede: organizacijsko znanje, tržno znanje, ustvarjanje znanja, Nacionalna agencija za inovacije (NIA)

IJMKL, 5(1), 57–79

Managerializem: Ideologija in njena evolucija

Christine Doran

Članek se osredotoča na managerializem z vidika njegovega statusa ideologije. V njem so opisani vzpon managerializma, poglavitni prispevki k teoriji o naravi managerializma in značilnosti ter izstopajoče točke pomembnega dela, ki obravnava to temo. Na začetku članka je podan opis glavnih značilnosti gospodarskih in socialnih razmer v Združenih državah Amerike, Veliki Britaniji in drugih zahodnih državah, ki so prispevale k dvigu intelektualnega in socialnega položaja koncepta managerializma. Del članka se posveča problematiki doseganje konsenza pri definiciji managerializma ter težavam, s katerimi se soočamo pri pozicioniranju managerializma znotraj konvencionalnega levega ali desnega političnega spektra. V nadaljevanju članek raziskuje vplivno različico managerializma, poznano kot »družbeno odgovorno« upravljanje družb.

Ključne besede: upravljanje družb, managerializem, managerji, delničarji, povojni konsenz, neoliberalizem, sindikati

IJMKL, 5(1), 81–97

Usmerjena inovacija poslovnih modelov

Stelian Brad in Emilia Brad

Inovacije v poslovnih modelih so ključnega pomena, saj pripomorejo k temu, da ostane podjetje konkurenčno in k večjemu dobičku. Zaradi številnih tržnih atraktorjev, je izbira ustreznih poti k razvoju poslovnega modela lahko težaven in tvegan proces. Članek predstavlja arhitekturni konstrukt analize in konceptualizacije za inovacijo poslovnega modela, ki združuje usmerjen razvoj in koncepte Strategije modrega oceana (angl. Blue Ocean Strategy), s ciljem zboljšanja učinkovitosti odločitev v tem procesu. V pričujočem članku se za to strategijo uporablja izraz usmerjena inovacija. Predstavljene so ključne točke, v katerih bi inovacije usmerjale poslovni model v smer trajnostne konkurenčnosti. Podane so zrele rešitve, ki so podprte z inventivnimi orodji za reševanje problemov. Uporabnost pristopa usmerjene inovacije smo dokazali s študijo primera inovacije poslovnega modela podjetja, ki se ukvarja s programsko opremo.

Ključne besede: poslovni model, usmerjena inovacija, modri ocean – neizkoriščen tržni prostor, usmerjen razvoj, dejavniki inovacije, univerza

IJMKL, 5(1), 99–121

Oblikovanje profila programa: primer dodiplomskega študijskega programa poslovnih ved

Vesna Skrbinjek in Valerij Dermol

Prispevek obravnava problematiko oblikovanja profila študijskega programa, v katerem so kompetence in učni rezultati na ravni študijskega programa sistematično povezani z učnimi rezultati na ravni predmeta. Podan je opis modela za oblikovanje profila programa za izbran dodiplomski študijski program na področju poslovnih ved. Naš pristop uporablja koncepta splošnih in specifičnih kompetenc, kot jih opredeluje projekt Tuning, za povezavo učnih rezultatov na ravni predmeta z učnimi rezultati na ravni programa, pri čemer je upoštevan prispevek vseh ustreznih zainteresiranih strani, z uporabo tehnike triangulacije (to vključuje študente, delodajalce in učitelje). Rezultati pokažejo jasnejšo sliko značilnosti programov z natančno opredeljenimi ključnimi kompetencami in učnimi rezultati, v povezavi s študijskimi predmeti, kot tudi jasnejši opis zaposlitvenega potenciala.

Ključne besede: profil programa, kompetenca, učni rezultati, Slovenija, učni načrti

IJMKL, 5(1), 123–136

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