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Creative Business Model Innovation for Globalizing SMEs

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1. Introduction

Internationalization of its activities and business model cannot be assumed as a habitual process in small entrepreneurial company's growth. Very many small businesses of big country origin do not need to internationalize themselves at all because of huge home market. Internationalization becomes topical for hi-tech small and medium sized enterprises (HSME) of small country origin because the need to cover R&D expenses ("push" factor) which is not realistic in own domestic market and attractiveness of bigger international markets ("pull" factor) (Luostarinen & Gabrielsson, 2004). The traditional model of internationalization is a slow, incremental and resource-intensive process known as the Uppsala model (U-model) of internationalization (Johanson & Vahlne, 1977; Andersen, 1993). The innovation related I-model links the gradual internationalization of an HSME to internal and external actors, and to factors carrying "push" and "pull" mechanisms (Andersen, 1993). The barriers derived from usually slow and resource-consuming processes of internationalization have been overcome by the new category HSMEs called "born global" company (BG). However, the phenomenon of BG-s is not fully explained by the more gradual U- and I-models, also known as the process models (McNaughton, 2003). BGs do not need to start in or focus for a long time success in home market; they may start globally, i.e. on other continents, from the very beginning. Although the definition of "hi-tech" is differently defined by many authors, the main characteristics are related to novelty of the product, R&D intensity of production/service, qualification of employees or belonging of the company to some research intensive industry sectors (Shearmur, Doloreux, 2000). Here, besides mentioned characteristic features, HSMEs are defined as the companies which are contributing to creation of high-technology new knowledge themselves, this knowledge is unique and creates competitive advantage on the market. Usually business model supports implementation of concrete advantages; it describes the way how a firm is creating value to all its stakeholders. From the company's position – the business model is mediating technical inputs into economic output (Chesbrough & Rosenbloom, 2002).

Some companies operate for a long time in domestic market, but then after some event (a critical incident) globalize themselves; these companies are called "born-again global" (BAG) firms (Bell, McNaughton & Young, 2001) and their behavior is defined as reactive (Bell et al, 2003). Into this category of firms belong partly also "globalizing international" firms, which have started their business within home continent after the domestic market

period (Gabrielsson & Gabrielsson, 2004). Then they start to globalize their activities outside home continent (ibid).

But the concept of born global or its modifications do not explain why and how some hi-tech small and medium sized enterprises (HSME) become global, while others do not. The shortcoming of the BG and BAG approach can be seen, as they do not expose the creative entrepreneurial processes which take place during internationalization/globalization. The entrepreneurial process includes (experiential) learning at both levels: individual (entrepreneur) and organizational (Corbett, 2005). Based on a concrete case study of knowledge-based small company leveraging its technological knowledge and reaching global market, a "learned global" concept is suggested (Mets, 2008). That involves the need to derive knowledge about the markets as well as creation of new technological knowledge and development of product(s) responding to higher market value, but also right positioning in the value chain of the concrete product or business (Vadi & Türk, 2009). This cannot happen accidentally, these processes need creativity, learning and accumulation of knowledge, and experience before becoming global.

Leverage of intangible resources was first seen as competitive advantage of multinational companies (MNC) by Hamel and Prahalad (1993). This phenomenon creates advantage potential for global corporation before local company, if implemented, disproportionately strongly exceeding their size ratio especially in knowledge-intensive spheres regarded as "new economy" (Mets, 2003). That points out that HSMEs of small and open economies (SMOPEC) (abbreviation from Luostarinen & Gabrielsson, 2006) are competing with global competitors not only in international markets, but also in home market. Of course, it is easier to enter psychically and culturally closer neighboring target markets than to become global from inception.

As can be concluded from the short overview above, in the core of business internationalization lies knowledge (push factor) as resource enabling HSMEs to respond to global market needs (pull factor) and real globalization process happens under the certain circumstances depending on knowledge-related processes and business model chosen for reaching to global market.

The chapter aims to conceptualise the business models and general factors of becoming global by technology- and knowledge-intensive SMEs of small open economy country origin.

To fulfill the aim the following research tasks are set up:

1. Examining main factors enabling global breakthrough by HSMEs.
2. Analyzing "knowledge-market" conceptual framework of globalizing business model for HSMEs.
3. Disclosing small transition country context of globalization of HSME.
4. Mapping empirically knowledge-market business model development trajectories for HSMEs of different technology sectors.

The results of the study provide better understanding of strategic options that "new economy" companies may follow in their internationalization process. To open theoretical background of the topic the next section clarifies the main trajectories and processes of global breakthrough of HSME in "born global" context. The following sections create

"knowledge-market" framework of HSMEs' globalization process and systematize some leveraging business models. After that, methodology and short description of a case study sample companies are given. Empirical findings and discussion of results, and conclusion end the paper.

2. Global breakthrough trajectories of HSMEs

Generalizing globalization process of HSMEs one can find three main ways differing from each other in terms of speed and extent of internationalization: gradual, born global (BG) and born-again global (BAG) trajectories (Johanson & Vahlne, 1977; Andersen, 1993; Bell, McNaughton & Young, 2001) as presented in Figure 1.

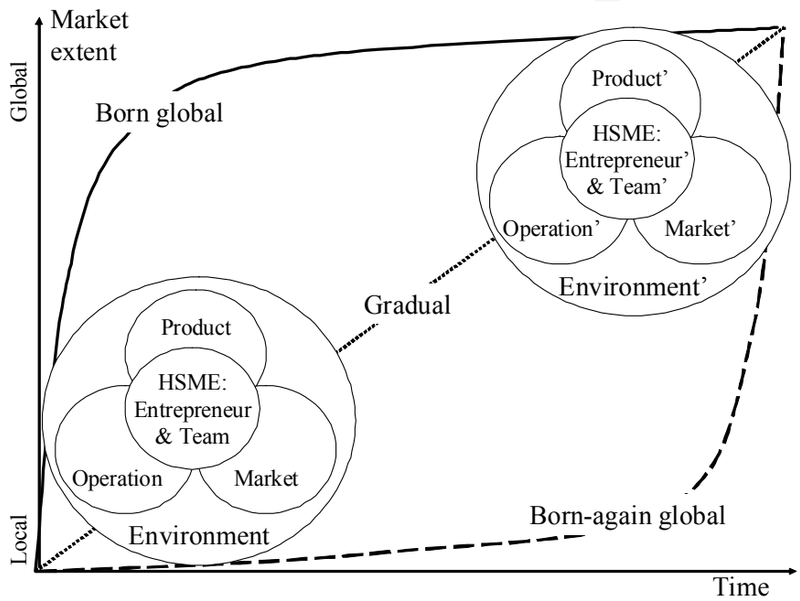

Fig. 1. Trajectories of HSME internationalization (Mets, 2009)

Luostarinen (1979) first introduced globalization strategy including three sub-strategies (or fields): the product (P), the operation mode (O) and the market (M), and altogether – POM-strategy. POM-strategy itself leads to global marketing strategy, which consists of pricing, distribution and customer strategy (Luostarinen & Gabrielsson, 2004). The POM-strategy as a model covers and partly overlaps the components of business model – the way how a firm is creating value to all its stakeholders. Researchers of Helsinki School Luostarinen and Gabrielsson (2004, 2006) have demonstrated that the BG may exist in any field of product categories of HSME: (1) high-tech, (2) high-design, (3) high-services, (4) high-know-how, and (5) high-system businesses. The authors argue also that one product category compliments another, for example: high tech companies offer services for their innovative goods, or, high-service companies package their product and manuals into diskettes, which presents physical goods (ibid). Characteristic to BGs is that they differ from product and operation mainstream patterns of internationalization of conventional (non-born-global) companies; the same is valid for their POM-strategy (ibid). Becoming global depends quite frequently on HSME's capability to attract venture capital (VC) companies to invest into BG.

VC investors affect the management of HSME, even employing professional managers into company, which accelerates globalization process. Some founders of HSMEs are more experienced and better skilled in global business, which speeds up the process (Luostarinen & Gabrielsson, 2006). This points out the importance of market learning in realization of own opportunities.

Effective recognition of opportunities is considered one the most important outcomes of entrepreneurial learning as an experiential process (see Politis, 2005; Corbett, 2005). The learning can be organizational; the "learning organization" is the concept used to describe an organization's ability to manage change (see for example Senge, 1990). From the perspective of entrepreneurial learning described by Politis (2005), it is more or less an individual process. This viewpoint is only partly supported by research among Italian technology entrepreneurs, where networking capability and the creation of technological competence with limited resources play a key role (Ravasi & Turati, 2005). Organizational learning of SME's in terms of an entrepreneur's capacity to learn and to integrate the working team remains the leading factor; and entrepreneurial learning is mostly an action-learning process (Deakins et al, 2000).

Three different internationalization routes/trajectories (shown in Figure 1) contain creative learning, which is more or less intensive in some period. The main result of learning is inventing and reaching business model corresponding to own product. Frequently the product contains intellectual property (IP) – invention protected by patent. That is the factor strongly attracting funding by VC. The main difference between BG and BAG is the timing and a moment of globalization.

BG means going global from inception. That means that not only the business idea, but also all other factors (Product, Operation, Market & Management) must be appropriate for the strategy of rapid globalization. Lack of just one of the factors can lead HSME to failure. BAG keeps the local business model for a long period, and may even involve some exports and other internationalization activities. Favorable events, or the accumulation of a success factor or resource, possibly gradually, can trigger the globalization process.

Although several authors have tried to define BG company via share of sales on international/global markets or period of becoming international/global, there is no agreement about the concrete value of criteria (Luostarinen & Gabrielsson, 2006; Svensson, 2006; Rialp, Rialp, Urbano & Vaillant, 2005). It seems that strategy (POM-model) and management behavioral patterns and ambition to achieve competitive advantage match better to general understanding of rapid globalization process than formal criteria. This position is supported also by the authors mentioned above. Hereby arises also another crucial aspect: not only global market breakthrough, but also protecting and deepening competitive advantage in global position has high strategic importance for HSME. That means the need to better understand the content of core competence(s) in creating long-run competitive advantage hard to copy by competitors on the market.

3. Knowledge-market grid – the field of creative actions for global HSMEs

The POM-strategy model is less explicit about the organizational mechanisms which besides entrepreneurial learning may release the potential for such behavior, or about what makes

this mode of operation possible. The competence and knowledge of organization acquire more power in organizational structures which use the mechanism of leverage. Leverage is defined as "the extent to which profits can be increased when revenues and capacity utilization rise" (Crainer, 1999). Often the concept of leverage is linked to the idea of stretching financial as well as non-financial resources (Hamel & Prahalad, 1993).

Leveraging intangible resources at the human level is achieved as a result of the multiple duplication of the working process, creating higher skills and performance along a learning curve, but it also means the initial creation and development of such skills and related competences. At company level, this means extending knowledge, skills, competence and performance over all parts of the organization, reaching every person engaged in the process. In knowledge business, leverage means invention, permanent improvement, and the acquisition of new "soft" and "hard" processes, and spreading of new technology in conjunction with what already exists. The leverage mechanism is a part of the mode of operation as explained in the matrix in Figure 2.

Market extent				
	High	Single/initial domain technology Diversification across the markets globally	Integrated technologies Diversification across the markets globally	**High system product Diversification across markets globally**
	Medium	Single/initial domain technology Duplication across familier markets	**Integrated techno-logies Duplication across familier markets**	High system product Duplication across familier markets
	Low	**Single/initial domain knowledge and inventions Single/home market**	Integrated technologies = combination of high-tech & service Single/home market	Multi domain technolo-gies = high system product Single/home market
		Low	**M**edium	**H**igh
		Complexity of knowledge		

Fig. 2. Knowledge-market leverage grid for technology business internationalization (based on Mets, 2009)

The matrix describes the strategic options of an HSME in terms of the leverage of technology and knowledge, and of markets. Leverage means combining several single domains of knowledge or technology with each other in order to gain more complex results. Hereby it should be mentioned that the complexity can be related to "product" as well to "operation" aspect of POM-model. That can mean growing complexity of technology knowledge in production process and can but must not necessarily reflect in product itself. Meaning of growing complexity contains here first of all growing multiplicity of (interdisciplinary) knowledge domains from high-tech, -design or –services to high-know-how, and high-system businesses as mentioned above (Luostarinen & Gabrielsson, 2004). Of course, complexity can vary between domains of single products, therefore complexity has relative meaning if implementing for comparison of concrete objects. Knowledge or technology

domain is characteristic to one concrete product/service with its modifications. Labeling quadrants with two axes (Market extent, Complexity of knowledge) in three-scale measure (L-low; M-medium; H-high) we can describe different ways of leverage of knowledge according to the globalization concept of HSME. The BG company is ready to move into the quadrants LH-MH-HH or even to start from there leveraging its business model at the inception. BAG company can follow more mazy trajectory, for example: LL-ML-LM-LH-MH-HH. This process could be understood as experiential learning, creating new knowledge in the company about product as well as about market (see similar approach: Casillas et al., 2009). As a result, unique high level products and services are created on the basis of the multiplication of new and existing knowledge and competences (for example, in quadrant LM). As the creation of high level competences is a path-dependent, usually the result of interdisciplinary (learning) process, it is a competitive advantage that is hard for competitors to replicate. The market can be expanded gradually by selling to neighboring and culturally close countries, or related markets, whereas if expansion into different markets in different continents is made in a very limited timeframe it is a global player. The more reachable and relevant to customer needs and use the company is the more chances it has of becoming a global player. Customer reach becomes critical for an HSME. Typically the Business to Business (B2B) model is prevailing before Business to Consumer (B2C) sales model among BGs (Luostarinen & Gabrielsson, 2006). Very often it can be difficult for a global business and networking model to reach every individual, for example peer-to-peer (P2P), like that of Skype (Yovanof & Hazapis, 2008). In that case, globalization is simply a global replication of the business model globally, or the business model itself is global. The uniqueness defends the company's position as global.

Nummela, Saarenketo and Puumalainen (2004) have found that companies with narrowly defined core competence started their international operations on average two years earlier than companies with broad competence. As could be understood from the grid (Figure 2) this means capability of HSME to go global with single domain knowledge. Does this contradict to learning and knowledge leverage processes in B(A)Gs? Obviously not, first, the company has its history which starts not just the moment of legal registration of its founding, but starts far before with the learning, experience and knowledge accumulation by founders and managers (Casillas et al., 2008). Second, (new) opportunity recognition by company leaders can happen in any period of company's existence, which can trigger absolutely new developments in/by the company like it happened with NOKIA moving into new technology and business field, which changed also the business model and behavior categorized as "globalizing international" (Gabrielsson & Gabrielsson, 2004). That means "pre-history" period of B(A)G is important, may-be crucial point of the globalization concept.

4. Leverage over business model

The basic for the business model are questions about the customer and the value for customer, and also the way firm makes money from that (Magretta, 2002). It is also generally agreed that business model is not a strategy as practically confirmed by many authors (Hedman, Kalling, 2001; Magretta, 2002; Shafer, Smith, Linder, 2005). Although in some cases authors state strategy being a part of business model (for example, Jansen et al, 2007), the concepts really have intersection and there is hard to "draw sharp boundaries

around abstract terms" (Magretta, 2002). Main issue is the fit between strategy and business model aspects (Zott, Amit, 2008). To define business model and its elements we can find tens of definitions (for example, Alt, Zimmermann, 2001; Shafer, Smith & Linder, 2005), and several categorizations for business model typology (Weill et al, 2005; Jansen, Steenbakkers & Jägers, 2007). Generalizing the concept in this article business model describes how the company is transferring its inputs (and own resources) into the value and provides the value for/to the customer, and earns the revenue. In that general framework of business model and strategic capabilities of HSMEs raises the question about globalization: which are elements supporting and enabling globalization of some businesses, and which – the barriers to that process.

Mechanism for leverage of resources, incl. intangible resources was first seen as competitive advantage of multinational companies (MNC) (Hamel & Prahalad, 1993), which could be very effectively implemented by replicating knowledge and competences based on their business models (Winter & Szulanski, 2001). This phenomenon sometimes known also as "McDonalds approach" (ibid) creates advantage potential for global corporation before local company. Therefore SMEs of "new economy" are seeking leverage mechanism to go global, some of them linking their business into networks of global players (MNCs), some – seeking their own independent business model using more world-wide network – the Internet.

Hereby we describe three different business models for globalizing of SMEs based on that criterion: first, being subcontractor – a part of value chain of MNC in all its locations (Fig 3), second, having own sales-revenue channel in the Internet or mobile environment, and third, based on that – so called "freemium" business model.

Example of the first case is Regio – provider of location based services (LBS) creating a part of value chain for Ericsson, global cellular (mobile telecom) network supplier, since 2004 (Mets, 2009).

The business model (Fig 3) is replicated on different markets, because every market (country, region) has own legal regulation of telecommunication. Besides, LBS are depending on mobile operator, local infrastructure, language and culture. These are elements requiring product to be customized for every concrete market. Therefore product mix (1...N) in concrete cellular value chain (1...N) can be different. But generally, as Ericsson's networks established by operators worldwide, Regio reaches the same local markets customizing and replicating its main business model globally. Although, company can offer some free product samples in special marketing campaigns, LBS revenue is mainly covered by users up to 100 %.

Usually there are no remarkable infrastructure, culture or language limitations for such a business, or these barriers are easily overcome. These companies can sell their hi-tech or knowledge-intensive products or services via Internet, which serves as service environment also or only the environment to reach contact to customers. Because of universal character of such a product the Internet enables leverage of product over global market. Usually, the question about ensuring trust is the question. On the example, Asper Biotech owes its fast market launch in genotyping to scientific reputation of the founder, well-known professor in the field (Mets, 2009).

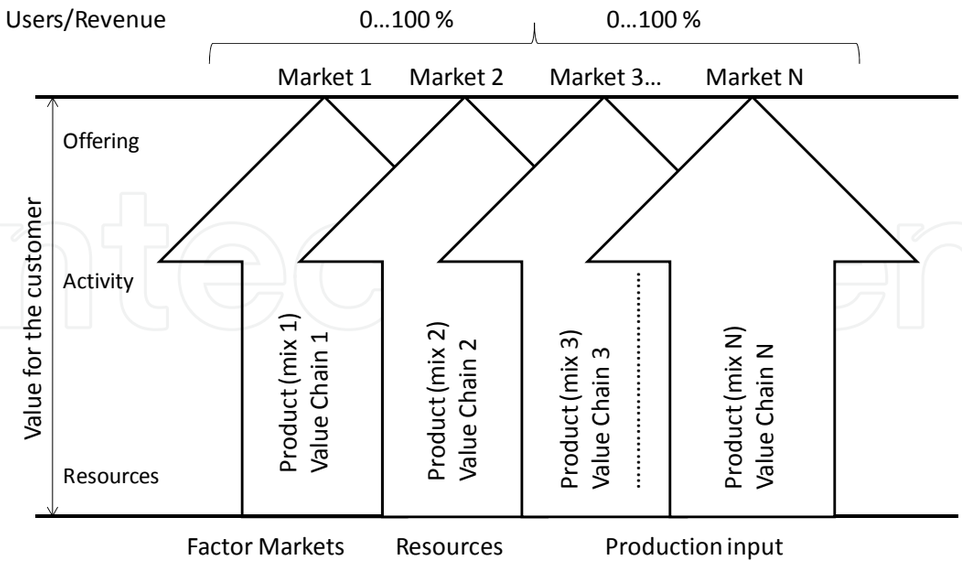

Fig. 3. Replication model: global replication of local business model = business model leveraged over market(s) globally (author's drawing)

Another type of business model is representing companies implementing the Internet environment for global sales (Fig. 4).

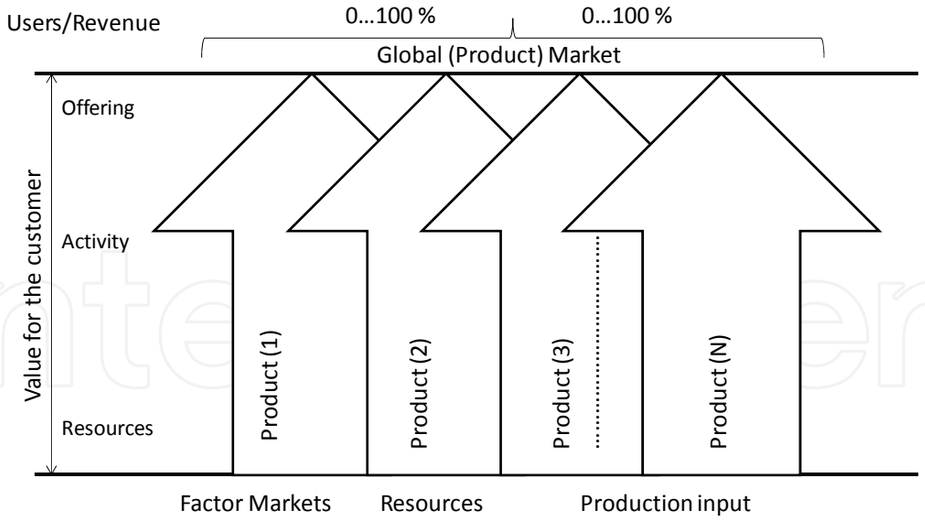

Fig. 4. Leverage model: global leveraging business model = leveraging market globally (author's drawing)

"Freemium" business model is represented by Skype (Fig 5) offering its VoIP service independently worldwide. Skype represents development trajectory, where globalization starts from one concrete worldwide free product and after global breakthrough it is

leveraged with wide range of improvements and additional premium (paid) functions (1,...,N). This is known as Freemium Business Model (Katzan, 2009) using the principle: "you give away 99% to sell 1%". Of course, regular delivery costs of Free Product (0) must be minimal, if not –company can hardly cover these costs from premium products. In real numbers, as of June 30, 2010, Skype had 560 million registered users [of free product mostly] with 8.1 million paying customers. "For the six month period ended June 30, Skype reported earnings of $13.1 million on revenue of $406.2 million" (Knowledge@Wharton, 2011). Partly, "premium product" of many Internet companies can be positioned among global leveraging models in Fig 4.

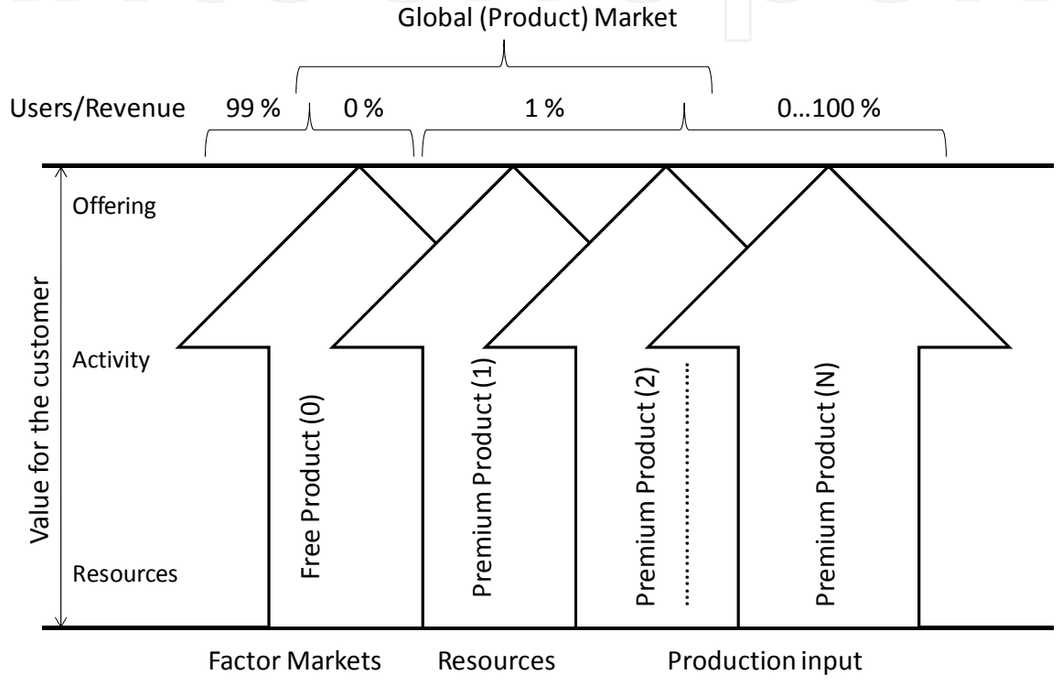

Fig. 5. Freemium model: global leveraging "freemium" business model = leveraging market globally (author's drawing)

Generalizing the models above, differentiation of replication and leverage models is not always explicit. Quite frequently, company can create its own service web-page in different languages meeting similarly local market expectations. Main feature to identify is that wider used languages, like English, enable spreading of market practically into any region and there does not exist, for example, physical or legal barriers to that process, especially on markets of R&D-intensive products. That means also implementation of similar marketing mix targeted to similar customers of different continents.

In replication (business) model (Fig 3) product-mix means complexity of products and relevant complexity of knowledge duplicated on every concrete Market 1...N. In other models (Fig 4 and 5) the product is related to one concrete relevant knowledge domain, from which part can be offered for free (Fig 5). Complexity of products and relevant knowledge is growing with widening their mix over the global market.

5. Empirical research and methodology

Empirical research is based on the process theory and general knowledge-market framework of globalization of HSMEs as discussed in the first sections of the chapter. The approach is especially, focusing on the role of knowledge (sometimes results of research and development – R&D), which is the basis for product as well as operations development in reaching global market. Globalization is understood not simply as internationalization, it is reaching other continents. Mapping the trajectory of knowledge-market development in internationalization of HSMEs can give basic understanding for further strategy creation by businesses as well as for actors of public sector in forming entrepreneurship policy. That means also the need to analyze changes of complexity of knowledge in that process – is movement from "high product" towards high-system business/product the rule for BGs and what is happening with complexity of (product) knowledge in globalization? What is the timing of accumulation of necessary competences for globalization and how it is related to internationalization process - is there so called "pre-history"? Can we identify entrepreneurial learning in globalization process? How has entrepreneurship environment influenced financing of HSMEs? And what are the consequences of competitive advantage, business model and strategy?

Case studies were used for mapping the main factors affecting internationalization of technology intensive SMEs in the "knowledge-market" framework. Main criteria for selection of a company for case study were the following:

- Estonian origin of the company or/and tight relations to Estonia;
- The company should be relevant to a success story, i.e. it should be already global;
- The main development track of the company could be observed;
- Main part of knowledge and technology is created in Estonia;
- The companies represent technologies of different fields.

It was not possible to find many Estonian companies that met the described characteristics, therefore more well-known of them were selected for the study. The sample contains five ICT, mainly Internet and software companies, and three HSMEs represent biotechnology field. Current case studies are based on secondary data and personal interviews. First of all, search for research publications was carried out using Google Scholar®. That gave possibility to learn the aspects researchers already covered with regard to case companies. Then historical facts and general overviews were collected from previous researches (Mets, 2008, 2009) and media (for example Tänavsuu, 2009). After that web-pages and annual reports of the companies were studied. The facts collected during the previous studies as well as current research were evaluated in the context of research questions. The aspects not covered before and newer trends were mapped, also some interpretations were checked in interviews.

6. Globalization cases of eight technology companies

Cases in the current chapter are presented in the Tables 1, 2 and 3 structured according to the raised research questions, aspects for mapping business model and globalization process of the HSME, and important factors in that process. The facts in tables are presented very shortly on the level of notes, partly disclosed more in the section of findings and discussion. Business models were categorized according to p. 4.

Company name, founders, founding data	**Regio**, 3 geographers, 1988	**Mobi Solutions**, IT & business students, Oct. 2000
Product/service, launched: date	Estonian road-map, 1989; GIS, 1994; LBS, 1999	SMS voting, 2001; SMS ticket, 2002; M-business/services...
Domestic period	Until 2001	Until 2002
Lessons learned before globalization	Modern GIS technology in USA, 1994; business development – risk capital, 1998-2000	Testing products/services on the local and neighbouring markets
Globalization	2004, LBS with Ericsson network	Associated companies and subsidiaries: Canada, 2006; China, 2008
Production development	ISO 9001:2000, since 2006	>100 services
Number of clients	>100 million	53385 service providers, 25.03.2011
Countries	In all continents with Ericsson	50 (covered by subsidiaries)
Details about BM	B2B; part of Ericsson's value chain	B2B; partnering with Ericsson; clients: Skype, Paymentwall, TravianGames, Barn Buddy, etc
Competitive edge	Latecomer effect in GIS, leverage of different technology domains	Easy to use; no fees (from concrete service only)
Strategy & IP	"Piggybacking", IP protected by business model	Leverage via subsidiaries
Customer involvement in BM development	Several tests of LBS, LBS development – via business partners: mobile network operator (EMT) and Ericsson	Tracking customers' reactions in SMS voting and other market tests

Source: Author's compilation based on Mets, 2008, 2009; Mobi Solutions, 2011; Raime, 2011; Rannu, 2004; Reach-U, 2011; Fortumo, 2011.

Table 1. HSMEs of replication business model.

Company name, founders, founding data	**Solis Biodyne**, 1995, university background of 2 founders	**Asper Biotech**, 1999, university professor & CEO of clinics	**Icosagen** (until March 2009, Quattromed), 1999; university spin-off, 4 researchers leaded by prof. Mart Ustav
Product/service, launched: date	DNA polymerases, dNTPs, PCR Master Mixes and other reagents	Genotyping equipment & service of human disease: DNA tests, 2001	medical molecular diagnostics, main customers: Estonian hospitals, 1999

Company name, founders, founding data	**Solis Biodyne**, 1995, university background of 2 founders	**Asper Biotech**, 1999, university professor & CEO of clinics	**Icosagen** (until March 2009, Quattromed), 1999; university spin-off, 4 researchers leaded by prof. Mart Ustav
Domestic period	Starting from university research needs	Practically did not exist	Small share of export; active growth on Estonian and neighbouring markets
Lessons learned before/after globalization		Selling only services, change of BM, moving equipment sales into associate	Hi-tech NPD is highly expensive; hardly manageable combination of wide product/service portfolio
Globalization	1998, USA, Germany, Finland	2001-2002, Japan, USA, Norway, Italy	2008, ASTM intern. standard D7247 on FITkit®; 2009, QMCF tech-gy licences to global pharmacies
Production development	ISO 9001:2000, since 2007	ISO 9001:2000, since 2000	ISO 15189, 2004; ISO 9001: 2000, 2007
Number of clients	>300	1000...10000	
Countries	>30	>40, in 2009	
Details about BM	B2B2C, distributers in 25 countries	B2C, direct sales of services over Internet	B2B
Competitive edge	High quality DNA enzymes - stable at room temperature	Recognized methodology, low cost	R&D-based service methodology; low cost R&D intensive service; strong growth-orientation
Strategy & IP	Patenting; distribution network development	Patent, IP partnering with Stanford University; focus on end users	Patenting; Standard-creator; widening local business via merger in 2006, sold to financial investor in 2008; transition from service to global IP business

Company name, founders, founding data	**Solis Biodyne**, 1995, university background of 2 founders	**Asper Biotech**, 1999, university professor & CEO of clinics	**Icosagen** (until March 2009, Quattromed), 1999; university spin-off, 4 researchers leaded by prof. Mart Ustav
Customer involvement in BM development	Low, practically following classical business model	Changes of BM from B2B2C to B2C, distributors' network replaced with direct sales over Internet to final customer	B2B; Local & neighbouring market service B2B has transferred into R&D and IP business mainly

Source: Author's compilation based on Solis Biodyne, 2011; Mets, 2009; Mets et al, 2010; Tänavsuu, 2009; Parts, 2011.

Table 2. HSMEs of leverage business model.

Company name, founders, founding data	**Skype Technologies S.A.**, 2002, Swedish-Danish-Estonian team	**Fraktal**, 2007, Skype-team Estonian members	**Sportlyzer** – start-up, 2009, karate Champion & web consultant
Product/service, launched: date	VoIP phone, launched Aug. 2003	Web design & service Edicy, Aug. 2009	Virtual personal coach, 22/03/2011
Domestic period	Did not exist	Practically did not exist	Start up phase
Lessons learned before/after globalization	P2P file sharing technology KaZaa	Experience of BM from Skype	Following BM of Skype
Globalization	Aug. 2003-Jan. 2004: users from 200 countries	Ongoing process	Start up phase
Production development	Intensive expansion of complexity of product	Customer involvement	Free product for customer-driven development
Number of clients, free/payable, million	560 / 8,1	0,23 / NA	Start up phase, NA
Countries	>200	>20	World-wide
Details about BM	P2P, freemium	B2C, freemium	B2C, freemium
Competitive edge	Free VoIP phone supported market expansion	Free web-host & design-based market expansion	Virtual multi-domain intelligence; free service-based market expansion

Company name, founders, founding data	**Skype Technologies S.A.**, 2002, Swedish-Danish-Estonian team	**Fraktal**, 2007, Skype-team Estonian members	**Sportlyzer** – start-up, 2009, karate Champion & web consultant
Strategy & IP	Patented product; collaborating & competing with telecoms	Basic product – free ad for the web	Basic product – free ad for the web
Customer involvement in BM development	Customer feedback for product development	Customer involvement mainly via product development	Customer involvement via product development

Source: Author's compilation based on Mets, 2009; Fraktal, 2011; Sportlyzer, 2011; Puus, 2011; Edicy, 2011; Knowledge@Wharton, 2011.

Table 3. HSMEs of freemium business model.

7. Findings about globalization and business models of HSMEs

Following general understanding from former researches, Estonia corresponds to the environments of small open economies' (SMOPEC) context of BG HSMEs being even remarkably smaller than Finland or Sweden covered by several authors earlier (Luostarinen & Gabrielsson, 2006). Since 1992 the Estonian government has practiced a liberal economic policy, and has opened the Estonian market to foreign goods and capital. That policy has helped to attract foreign investments which fostered to overcome backwardness inherited from Soviet occupation. As liberal but also comparatively poor economy Estonia has not supported neither technology-based nor any start-ups as strongly as neighboring Western countries could do. Therefore the main survival condition for companies has been the balance between costs and revenues which did not give the chance to invest enough into new technology development.

Case 1. Pour business environment at starting company is a part of explanation of "long journey" of Regio, founded in 1988 (Table 1), to global market as presented in Figure 6.

Before internationalization Regio had already quite a wide range of products of different technology domains (design, cartography, GIS and software). Because the lack of resources product development was hindered for several years in the mid of the 1990s. Later, in 1998 the Baltic Small Equity Fund (BSEF) became risk capital partner for Regio, but even that was not enough. More possibilities were created through the merger with DONE for additional investment in 2000. In February 2002, the parent company of Regio went bankrupt, which gave a chance for by management buy-out a year and a half after the merger. Global breakthrough succeeded first with one product only – location based services (LBS) provided as a part of value chain of global player Ericsson since 2004. Spreading worldwide LBS service afterward has enabled to compliment global product with the elements of its traditional and new products leveraging complex knowledge across global markets. The process in "knowledge-market" framework is described with S-shape curve.

Case 2. The journey to its own product mix and business model by the founders of Mobi Solutions, students of business and IT, was much smoother based on a good example

provided by the invention of mobile payment and launching mobile parking system in Estonia by Estonian Mobile Telephone just on the 1st of July 2000 (Rajasalu and Laur, 2003). But even then Mobi Solutions reached its own model leading to global market after several years of local and regional testing of their own services. Now, Mobi offers the specific "easy to use", "pay after receiving money" and "pay only as much as you use" business model to its clients. By creating the business model "ready for use" for their clients, Mobi has created its own business model to rent out the business model to customers. In this way the customers are co-creating their own businesses with Mobi.

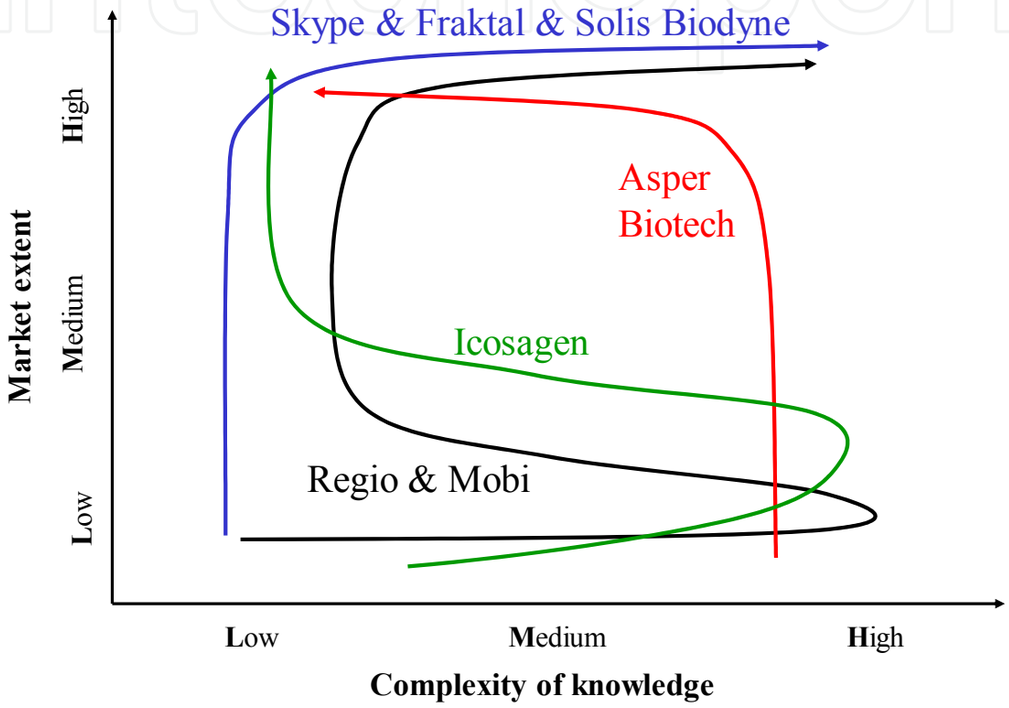

Fig. 6. Product knowledge-market trajectories of globalizing HSMEs (the author's drawing)

Mobi seems to be also "learned global" company with one big difference, although implementation of its services needs mediation of local mobile operator and network provider (frequently Ericsson), spreading of Mobi's services is quite free. And the Internet serves for offering and revenue of service – market and value chain of Mobi is quite independent compared to Regio. The involvement of customers in new product development process of Mobi, implementing of Living Lab features were unique. But now, having already global experience, Mobi team was involved into cluster initiatives of Enterprise Estonia developing Living Lab experience in Estonian ICT sector (Varblane and Lepik, 2010). Mobi's case is interesting because the lack of external funding in early development phase – main investment was founders' own work and spending money; even earnings then went for salaries of employees, but not to owners. In that stage VC providers did not agree to fund them, but later if offered, Mobi did not need VC investment any more.

Case 3. Solis BioDyne (Table 2), founded in 1995, started like Regio in still poor economic conditions with a good academic business idea originating from a university. It took only

three years to reach the US market with its main product of DNA enzymes and reagents. The company has built up its own network of distributors. This is quite a classical distribution system, only because of the international nature of science and worldwide courier services, sales are developed according to the same model globally as shown in Fig. 6. The company became famous for offering technical solution to the problem of the Bill & Melinda Gates Foundation in HIV DNA transport in the so-called "jungle conditions" (Tänavsuu, 2009).

Case 4. The case of Asper Biotech is an example of contrary development of product on the market (Table 2). The beginning was also quite classical stage of knowledge accumulation. Professor initiating the HSME was very active also in business development and finding the funding. Using already improved entrepreneurship environment in Estonia in the beginning of 21st century the founders succeeded to involve remarkable resources for product development from different risk funds and European Union framework program. Complexity of the product range at the beginning was quite high. Asper Biotech started global offering from inception. It was supported by advertising, research publications and personal contacts of prof. Metspalu. Learning in the process of market development it became clearer that in the specific business with very small shipments and mediation of genotyping services "business-to-business" (B2B) model with local partners could not be efficient. As a result direct sales ("business-to-client" – B2C model) to final customers were implemented. The most complicated part of product range – technology platform with complementary methodology and software needed another commercialization approach, therefore it was moved into another business Genorama with its specific strategy. As a result, a complex system-offer was replaced with less complex product/service for the client in the global niche market. In the "knowledge-market" axis the process could be described with the rotated L-curve (Fig. 6). Besides that the company has found that they still may be at the very beginning of customary market creation for gene test and diagnostics which market need should be facilitated.

Case 5. Somewhat similar is the development pattern of another biotech company Icosagen, which started as a university spin-off, but its trajectory is influenced much by high-level competence-base, local service business-oriented growth with smaller share of international transactions during several years. Intensive product development, license deals and patenting ensured the real breakthrough with standardizing their FITkit® technology in specific field globally. Selling local market oriented medical diagnostics subsidiary with the wide product range in 2008 to VC created a new situation for the company – now R&D and services could be more focused on the development of highly efficient QMCF technology and IP trade as well on services implementing the FITkit® technology. This is not clear yet about leverage potential of global breakthrough with other related technology/knowledge domains, therefore the development trajectory is described with lower half of S-curve. Icosagen has heavily utilised IP protection. Icosagen has patented and protected trademarks of their solutions FITkit®, E2Tag, and QMCF. Even more, Icosagen has invested their funds and efforts in standardizing their technology. In 2008 ASTM International (www.astm.org) adopted a new standard for test method that bases on Icosagen's FITkit® technology.

Case 6. Skype represents another development trajectory, where globalization starts from one concrete product and after global breakthrough it is leveraged with wide range of

improvements and additional functions growing knowledge complexity of the product. The trajectory (see Figure 6) seems to be very relevant to classical process of moving from "high product" to "high system" business, which could be described with the Γ-curve. The knowledge accumulation for VoIP-company was strongly supported by "pre-history" of technology and business competences developed in KaZaA project. The same important was also an international team, its visionary ideas, technological skills and capability to attract VC at the very early stage. Although some experts guess that in technological meaning Skype did not change too much in ICT world (Landler, 2005), main was clever way for "putting together bits and pieces". The "peer-to-peer" (P2P) technology concept and business model of the Skype has found being disruptive innovation (Yovanof & Hazapis, 2008) completely changing global market of telecommunication. The case confirms again that the most effective innovations do not need hard basic research any more, just new ideas how basic knowledge could be used (Mets, 2006).

Case 7. Fraktal – the company developing web-design concept and environment Edicy has its roots in Skype as the founders came from the Skype team, but also the business model and internationalization trajectory have a very similar (but not completely configured) yet pattern (Fig. 6). However, it includes a very specific aspect – involvement of customers in its product development phase.

Case 8. From that idea the next step can be seen at Sportlyzer (Table 3), which besides "freemium" business model and customer involvement in product development has gathered together an inter- and multidisciplinary team for creating virtual intelligent consultant in sports coaching for active people around the world. The initiator of the idea Tõnis Saag (32) has personal long-term experience in sports, after receiving a bachelor degree in public governance he started master program in entrepreneurship. One of his first study tasks – his business plan has been realized in a new business now. The concept of virtual personal trainer was just launched in March 2011. Its globalization trajectory is expected to follow the Skype, but as it is still in embryonic phase, no track in Fig. 6 yet. Start-point could be expected somewhere at higher complexity service then.

As seen from the mapping of knowledge-market trajectories of eight hi-tech companies there exist three main patterns for reaching global market: rotated L-curve and Γ-curve describing born global companies, and S-curve belonging to learned (sometimes "born again") global company. All these patterns can be combined for description of some longer period of development processes. The type/pattern of trajectory seems not to be depending on technology field of company – ICT or biotech. Besides, in biotech business on the example of three companies patenting of own inventions seems more compulsory than for ICT field where Skype has been more active in patenting, others less. Partly that can be related to observation that product ideas of biotech companies are more based on university R&D, ICT businesses have weaker linkages to basic research.

8. Main results and conclusion

Analyzing globalization processes and trajectories, and reaching real functioning business model configuration by eight completely or partly Estonian-origin case companies above allows us to make some generalizations.

First, striving to globalize own business is very natural for hi-tech SMEs of small country origin, which confirms so called push factor of need to cover R&D expenses and pull factor of demand by huge global markets.

Second, although "born global" concept of such type of HSME has widely spread among researchers, understanding real mechanisms and business models enabling to implement these mechanisms for born global businesses remain behind the screen until somebody discovers opportunity and invents business model to implement that opportunity. Usually this creative process can be not synchronized with creation of formal business body (company). Therefore not depending on "born" or "born again" concept real creative "learned global" process for business model invention takes a place.

Third, appearance of the "born global" phenomenon in company's behavior presumes knowledge and experience accumulation – i.e. entrepreneurial learning period, which is leading to (global) business (breakthrough) opportunity recognition. This competence accumulation period can take place before formal company founding as well as in the framework of already functioning businesses.

Fourth, although the global breakthrough in narrow niche market and product domain seems to be dominant among HSMEs, this is not the absolute rule as demonstrated by Asper Biotech going global with new technology platform and service based on that in the same timing. Later they reshaped their business model raising the question about rationality not possibility of offering some product combination.

Fifth, sectorial differences between HSMEs partly influence the business model to be used. We have no example of biotech companies using freemium business model spreading wider in ICT business. In that context biotech companies combine Internet with more traditional business logistics although globalization knowledge-market trajectories can be similar as demonstrate the cases of Solis Biodyne and Skype or Icosagen and Mobi. That means just global breakthrough from inception with Γ-shape trajectory or journey of learning according to S-shape trajectory can characterize the companies in both sectors.

Sixth, business model, especially "freemium" type of that in ICT field seems to be the instrument to overcome cultural, legal and other barriers of traditional businesses like these appear according to Uppsala model. Another approach is business in global communities with similar culture and values like "scientist to scientist" model as demonstrate biotech HSMEs.

Seventh, as shown by cases of Regio, Mobi and Sportlyzers there is growing importance of multi-disciplinary teams in development of HSMEs.

Eighth, the last trend seems to be involvement of customers into product as well business model development process as demonstrate the followers of Skype – Fraktal and Sportlyzer.

Usually BG HSMEs focus on global niche market, but they can also challenge the whole industry. It seems that partly the aspect depends on the maturity of the industry and the linkages to basic research. Skype is a good example of going wide market from inception. But Asper Biotech could refer to the potential/chance to turn new technology niche product/service into wide customer market need as a result of growing awareness of potential clients in genome testing.

BGs of small (transition) country origin have usually relatively low resources for marketing, but not only, there is lack of resources for anything. But this could be not disturbing to global breakthrough as seen on the example of Skype. Clever business model and free of charge basic service with freemium business model can create absolutely new approach in the industry. Technology innovation that means also innovation in the market and human behavior, can finally lead to social innovation. Moving from single product/knowledge domain to "high system" products is not the absolute rule. Market can cause the contrary processes, i.e. simplifying complexity of the product as well as change of the business model. That happens in the learning process the company can experience on the market.

The experience with the eight Estonian-related case study companies demonstrate that the HSMEs of small country origin can be very successful, but even success stories have their "critical" points, learning from which creates better basis for knowledge economy of the country. From lessons experienced by case companies can learn entrepreneurs and managers of technology and knowledge-intensive businesses as well as relevant public sector. These are lessons for educators of future engineers and scientists-technologists – how to integrate technology competences with entrepreneurial skills. The schools the engineers and researchers of case companies graduated from are still giving too little knowledge, skills and attitude towards creative behavior in entrepreneurship. Creative entrepreneurship is the challenge not only for higher education institutions of Estonia but also for the whole national innovation system.

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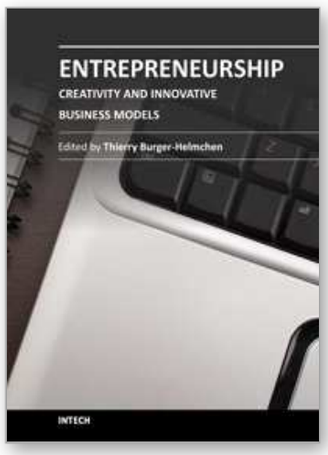

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What are the differences between an entrepreneur and a manager? According to Schumpeter, the main difference lies in the entrepreneur's ideas, creativity, and vision of the world. These differences enable him to create new combinations, to change existing business models, and to innovate. Those innovations can take several forms: products, processes, and organizations to name a few. In this book, an array of international researchers take a look at the visions and actions of innovative entrepreneurs to be at the source of new ideas and to foster new relationships between different actors to change the existing business models.

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