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**THE ROLE OF BUSINESS INTELLIGENCE FOR
INTERNATIONALIZATION AND ORGANIZATIONAL LEARNING**

Master's Thesis

Department of Management and International Business

February 2015

Unit Department of Management and International Business			
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Title The role of Business Intelligence for internationalization and organizational learning			
Subject International Business	Type of the degree Master's Thesis	Time of publication February 2015	Number of pages 93
Abstract			
<p>Today, data is increasingly gathered from end users via products and services. Business Intelligence (BI) tools may be utilized for analysis of the collected data to improve decision making process in a firm. This thesis focuses on the role of BI tools for internationalization and organizational learning. Particularly, usage of analytics tools in the mobile domain is concentrated on.</p> <p>A multiple case study was conducted in collaboration with four Finnish companies. All the studied firms aim at internationalization, and have utilized mobile analytics tools in their business operations. The results indicate that BI/mobile analytics tools may facilitate organizational learning in many ways. Further, organizational learning may be part of the internationalization process of the firm. Based on the results, a model was developed and proposed, which integrates usage of BI tools with internationalization, and organizational learning theories. The model may be considered as a starting point for further theoretical development in the future.</p> <p>The main managerial implication of the study is to understand the significant role of BI/mobile analytics tools in organizational learning, when aiming at internationalization in the context of mobile application business.</p>			
Keywords mobile analytics, application store			
Additional information			

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1 INTRODUCTION

Internationalization process of a firm has been characterized as a continuous learning process. Before making a commitment for international business operations, a company learns about foreign markets. Learning may include gathering information about potential customers, competitors, market size, and legislation. In other words, the company gathers market knowledge. This may reduce uncertainty about markets. If potential is seen in the foreign markets, the company may commit to foreign operations. After initial commitment, the company learns about the foreign market, gains experiential knowledge, and integrates the knowledge into the company. This may further reduce uncertainty about foreign markets, which may lead to further commitment of resources to foreign operations. (Johanson & Vahlne 1977.)

A related concept is organizational learning, which refers to learning through organizational inquiry (Argyris & Schön 1996: 11). Effective organizational learning may lead to better performance of the firm (Hung et al. 2010). Internationalization and organizational learning theories have been associated on a theoretical level, and their effect on performance has been identified (Hsu & Pereira 2008). It was identified that managers should understand the company as a knowledge-based entity, instead of focusing only on economic performance (Hsu & Pereira 2008).

Business intelligence (BI) may be utilized in internationalization and organizational learning. Business intelligence is characterized as the usage of technologies to enable acquisition and analysis of data to improve decision-making process in a company (Seah, Hsieh & Weng 2010: 368-369). The gathered data usually encompasses information about operations and customers in order to get better insight about performance. The collection and analysis of huge volume, velocity, and variety of data is currently also characterized by the 'big data' phenomenon. The benefits from big data have been envisioned as gaining cost and time reduction, development of new data-based offerings, and support for internal decision-making process (Davenport & Dyché 2013). Competing in big data and analytics has been envisioned as one of the main trends of the near future (Bughin, Chui & Manyika 2013).

Many business intelligence use cases exist today. UPS is gathering information about package logistics for achieving cost reductions, United healthcare processes automatically voice recorded customer feedback for increasing customer satisfaction, and Ceasars casino is gathering information about real-time playing at slot machines (Davenport & Dyche 2013) for marketing purposes. Also, social networking applications have been utilized for data collection. For example, Twitter and LinkedIn gather data, which is utilized for development of new services for end users (Mishne et al. 2013) (Sumbaly, Kreps & Shah 2013). An interesting phenomenon is the practise of business intelligence in the context of mobile applications i.e. BI with 3rd party mobile analytics tools. Examples of mobile analytics include gathering of information about real application usage patterns, observing of revenue streams from different countries, segmentation of users, and gathering of feedback from end users. The acquired information is potentially important from the point of view of organizational learning and internationalization.

Few reports exist about practise of business intelligence from the point of view of organizational learning and internationalization to the best of the author's knowledge, which is the focus of this thesis. Especially, the practise of BI in the context of mobile applications is focused on.

1.1 Phenomenon under study

Figure 1 presents theoretical framework and phenomenon of the study. The main phenomenon is the use of business intelligence for internationalization and organizational learning. Exporting and e-commerce theories are part of the theoretical context, which are studied from the point of view of internationalization and learning. The context of the study is mobile application stores, and usage of mobile analytics tools and related infrastructure for the purpose of organizational learning and internationalization.

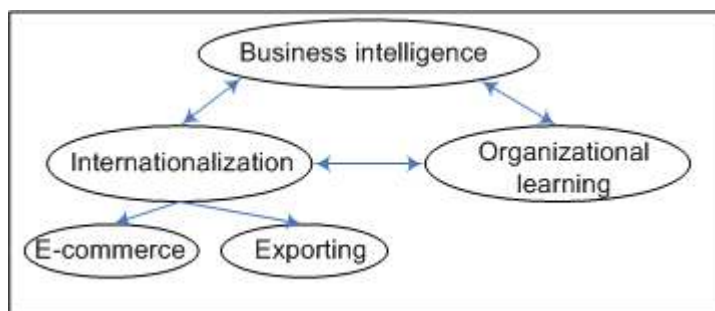


Figure 1. Theoretical framework and phenomenon of the study.

1.2 Motivation

A research gap exists regarding the role of business intelligence for organizational learning and internationalization. The study is further motivated by the following rationale:

- It is important to understand the types of learning for internationalization, which business intelligence can or cannot facilitate. Based on a better understanding, internationalization process of companies may be optimized and possibly fastened.
- It is important to understand if learning with business intelligence can decrease liability of foreignness/outsiderness (Johanson & Vahlne 2009: 1426), which could lead to faster internationalization process for a firm.
- Many free mobile analytics tools are available, and they are widely used in the development of mobile applications (Salz 2014). Mobile application business is a very competitive business field (Holzer & Ondrus 2011) (Salz 2014) to conduct research on.
- Business intelligence may be part of a competitive advantage for a company (Schubert, Williams & Woelfle 2011). It has been claimed that business intelligence may improve understanding of organizational performance (Schl afke, Silvi & M oller 2013), create time and cost reduction, and support internal decision making (Davenport & Dych e 2013).

- Other branches of business may learn from this study. Currently, business intelligence practises in an international environment are conducted in mostly IT-based businesses. However, an increasing amount of businesses are conducting big data analytics, which may encompass development of all products and services (Davenport 2013).

The theoretical framework was constructed based on the following rationale:

- There are few studies, which integrate organizational learning with internationalization theories (Hsu & Pereira 2008), (Anderson & Skinner 1999), (Chiva, Ghauri & Alegre 2013). As learning is a central theme in both theoretical approaches, a better understanding of their relationship may be needed.
- Exporting is part of the theoretical framework, because application stores enable exporting of application related transactions (e.g. in app purchases). Exporting is focused on from learning perspective for internationalization. Especially, it is considered how business intelligence can facilitate learning for exporting.
- E-commerce is part of the theoretical framework, because exporting via application stores is essentially e-commerce. E-commerce is also focused on from the learning perspective. The role of business intelligence as part of e-commerce should be understood better.

1.3 Research topic and research questions

The main topic of the research is the role of business intelligence for internationalization and organizational learning. The study is conducted in the context of mobile application stores, which enable many opportunities for internationalization and learning.

The main research question is:

RQ1: How can business intelligence facilitate organizational learning for internationalization?

The first secondary research question is:

RQ1.1: How business intelligence facilitates learning for internationalization?

The second secondary research question is:

RQ1.2: How business intelligence facilitates organizational learning?

1.4 Main concepts

Business intelligence (BI) = BI is referred to as “applications and technologies for gathering, and providing access to, and analysing data for the purpose of helping enterprise users make better business decisions” (Seah, Hsieh & Weng 2010: 368-369).

E-commerce = E-commerce is comprised of business-to-consumer and business-to-business transactions, and transactions and business processes on the Internet to support selling and purchasing activities (Alrawi 2007: 223).

Internationalization = Continuous learning process of a company, in which market knowledge is gathered based on experiences in foreign markets (Johanson & Vahlne 1977). The process may also include learning about knowledge opportunities, and development of a network position by making commitment to relationships (Johanson & Vahlne 2009).

Mobile analytics = Usage of BI tools (such as 3rd party mobile analytics) tools in the mobile domain. 3rd party analytics services provide tools for getting a better understanding on visitors, demographics, user agents, content views, and interactions in the mobile domain (Mayer & Mitchell 2012: 419).

Organizational learning = A learning process, which leads to the creation of new knowledge or understanding as an organizational whole. “Organization learns if any of its units acquires knowledge that it recognizes as potentially useful to the organization” (Huber 1991: 89).

1.5 Structure of the document

Chapter 2 presents a literature review on internationalization, organizational learning, exporting, and e-commerce theories. Earlier work on business intelligence and mobile analytics tools are reviewed in chapter 3. Methodology and case companies are described in chapter 4. Results of the study are presented and analysed in chapter 5. The results are discussed in chapter 6, and a conclusion is presented in chapter 7. The appendix includes a detailed structure of the semi-structured interview, which was conducted with the case companies.

2 INTERNATIONALIZATION AND ORGANIZATIONAL LEARNING

2.1 Learning

A lot of research has been conducted on learning theories, but a comprehensive and integrated theory on human learning may not exist. Adult learning has been defined as the reception of new information, retention over a period of time, and its subsequent recall. Early psychological experiments suggested that three memories exist facilitating the memorization process: sensory, short-term, and long-term memory. Existing knowledge of the learner has an effect on how effectively new information can be analysed and stored into long-term memory, which may be particularly important, when new conceptual information is learned (Lovell 1980.)

The main early research directions of learning have been stimulus-response association and Gestalt psychology. Stimulus-response direction focuses on identifying successive steps in learning. It can be further divided into trial and error, classical conditioning, operant conditioning, positive reinforcement, negative reinforcement, punishment, and shaping. Gestalt theory takes the view that the learning is a result of integrating and organizing perceived information. The different levels of learning can be further categorized into a hierarchical model (Gagne's model). (Lovell 1980.)

A later learning approach includes transformation theory, which attempts to explain how adult learning is structured, what processes are involved, and how experiences are changed and transformed (Mezirov 1991). It focuses on meaning as the centre point of learning, which guides the way people think, feel or act. It defines learning as the process of using prior interpretation of meaning, when revising interpretation of meaning based on new experiences (Mezirov 1991: 12).

2.2 Internationalization

Adult learning theories focus on learning of the individual, whereas economic studies focus on learning conducted by companies. From internationalization point of view, companies internationalize by continuously learning about international operations. Uppsala-model (Johanson & Vahlne 1977) consists of state (market knowledge,

market commitment) and change aspects (commitment decision, current activities). In the theory a company gathers market knowledge based on experiences in foreign operations. Market knowledge may include aspects such as business climate, cultural issues and characteristics of customer firms. Gaining of market knowledge reduces uncertainty about foreign markets. If market potential is observed, the company may make a commitment for establishment of foreign operations. After initial commitment, the company gains more experiential knowledge via current activities, and integrates the knowledge to the company. This should further reduce uncertainty about foreign markets, which may lead to further commitment of resources to foreign operations. Commitment decision is assumed to be made based on observed problems and opportunities in the foreign markets. (Johanson & Vahlne 1977.)

The Uppsala-model was initially validated with Swedish manufacturing firms, which indicated that firms internationalized gradually. First, firms started by exporting, which was followed by establishment of a sales subsidiary. Finally, a foreign investment for manufacturing was made. The timing of the events seemed to be related to psychic distance to the foreign country, which means factors (e.g. language, culture, business practises) preventing flow of information to/from the market. (Johanson & Vahlne 1977.)

The Uppsala model has been critically reviewed. It was claimed that the model applies a narrow interpretation of learning, which may limit certain kind of internationalization behaviour. The Uppsala model mainly considers learning through experience, but doesn't take into account learning through mimetic behaviour, incorporation of other units to learning, or searching for alternative solutions to the current business. Also, if the learning organization is considered as loosely-coupled, it may create problems to the model's possibility to explain internationalization behaviour. (Forsgren 2002.)

Johanson & Vahlne (2003) started to develop a business network perspective to the internationalization process model in order to capture changes of the business world. In the network perspective, relationships between partners develop gradually, and firms learn from interaction between each other, and commit stronger to the relationship. In the updated model (Johanson & Vahlne 2009) change aspects include

relationship commitment decisions, learning, creating, and trust-building. State aspects include knowledge opportunities and network position. The authors propose that overcoming of traditional entry barriers is becoming less important. Instead, internationalization is focused more on strengthening of a network position. Existing business relationships enable identification and exploitation of opportunities, which impacts selection of geographical market and mode of entry. It is posed that learning and building of commitment occurs in relationships, which is strongly related to identification and exploitation of opportunities. Internationalization is assumed to be contingent more on developing of opportunities than overcoming of uncertainties. Opportunities are assumed to be the most important aspect of knowledge, which drives the internationalization process. Other important components of knowledge include needs, capabilities, strategies, and networks of related firms. A new element creating change in the model is trust, which has an affective dimension. Finally, the model includes relationship commitment decisions as a changing element. Decisions may be made in order to develop new relationships, or to build bridges to new networks.

Learning in the original model (Johanson & Vahlne 1977) comprised of development of experiential knowledge in current activities, which enabled establishment of foreign operations. The new model (Johanson & Vahlne 2009) includes learning of relationship-specific knowledge, which includes heterogeneous knowledge about each other's resources and capabilities. The interaction between relationship partners is also expected to contribute to the development of general knowledge about international relationship development. Finally, it is concluded that insidership to networks is critical for successful internationalization, which is also referred with the concept of liability of outsidership. It means that problems and opportunities of internationalization are becoming more specific to relationships or networks instead of country specificity (liability of foreignness).

Gradual internationalization model has been studied in the context of e-commerce. The results indicated that social-cultural distance index explained internationalization pattern better, when compared to Hofstede's cultural distance index. The pattern of internationalization was rapid, and services were often introduced to multiple countries at a time. (Kim 2003.)

Uppsala-model of internationalization has also been evaluated in the context of Internet-related firms (Forsgren & Hagström 2007). It was discovered that internationalization was fast and discontinuous, instead of slow and incremental process as predicted by the model. The main reason for selection of foreign markets was maturity of Internet usage, instead of consideration for factors related to psychic distance. The studied firms also had an explicit internationalization strategy instead of reactive and adaptive behaviour. A crucial factor in internationalization was shareholders of the companies, which demanded a rapid internationalization process. Learning in this context was proactive as acquisitions were used for internationalization, which is in contrary to the incremental behaviour anticipated by the Uppsala-model.

2.2.1 Exporting

Identification and evaluation of markets has been a major thematic area in earlier exporting research (Leonidou, Katsikeas & Coudounaris 2010). This may also be an important topic from learning point of view, since it covers export information, environmental scanning, and export market research. When exporting markets are evaluated, objective or experiential knowledge needs to be gathered. The former is obtained via training or from public sources (e.g. government statistics), while the latter can be gained from execution of foreign operations. Typically, in export ventures quality and quantity of export information is limited, and is not cheaply available. Uncertainty regarding exporting may be reduced by gaining more foreign-market related information, which is particularly important during the initial stages of exporting for identification of market opportunities. (Leonidou & Katsikeas 1996.) Learning and unlearning in the pre-exportation phase of firms has been studied (Casillas, Acedo & Barbero 2010). The results among Spanish firms in service and manufacturing sectors indicated that possession of knowledge, which originated from individual, organizational and supra-organizational sources, was positively related to the search of new knowledge i.e. the intention to export. The need to unlearn routines and knowledge was related to export intentions, as well as to the search and exploration of new knowledge. The implication is that internationalization often requires new capabilities, which are built around the unlearning process.

Yeoh (2004) studied international learning in exporting context. Three types of organizational learning were identified: technological, market and social. The higher the different types of learning, the higher were the export sales. However, only knowledge gained via social and market learning (knowledge from technological learning was not) was positively related to satisfaction on profit change. Thus, internationalizing companies should also be aware of the potential downsides of internationalization such as expectations about profit changes from technological learning, which may be difficult to be integrated to the company. Also, organizational costs incurred from technological learning may consume the increased profits.

Learning by exporting has been studied in the context of high-technology SMEs in the UK. Learning by exporting refers to the transfer of knowledge via internationally traded goods and services and related technology transfer, which leads to increase in productivity and economic growth for the exporting firm. The results suggest that exporting facilitates innovation, but doesn't make firms more innovative. (Love & Ganotakis 2013.)

The effect of technological capabilities on learning (measured as productivity) in the context of Spanish exporting firms has been studied. The main result is that firms, which invest more heavily in R&D benefit from exporting more than firms, which make smaller investments on R&D. The implication is that technological leaders may benefit more from exporting than technological laggards. Also, managers may consider exporting as a way to improve competitiveness e.g. as a form of knowledge spillover (i.e. learning from exporting) in foreign markets. (Garcia, Avella & Fernandez 2012.)

Finally, organizational learning as part of export development process has been a contemporary research area in exporting. Identification and evaluation of export markets in conjunction with database and decision support systems has been mentioned as an interesting topic for further research. (Leonidou, Katsikeas & Coudounaris 2010.)

2.2.2 E-commerce

Definitions of e-business and e-commerce are often used interchangeably for conducting Internet mediated transactions. The main elements of e-commerce are business-to-consumer (B2C) shopping, transactions between businesses on the Internet (B2B), and transactions and business processes on the Internet for supporting selling and purchasing activities (Alrawi 2007: 223). E-commerce is focused primarily on transactions with customers, whereas e-business expands connectivity of the organization to suppliers, employees and business partners (Pavic et al. 2007: 322). E-business has also been defined as comprising of e-commerce, business intelligence, customer relationship management, supply chain management, and enterprise resource planning. E-commerce web sites have evolved from one-way communication of a reactive web towards secured and integrated web supporting any-to-any communications (Chu et al. 2007).

The effect of Internet on internationalization has been studied. It has been discovered that Internet can decrease the effects of liability of foreignness and resource scarcity, which increases the speed of internationalization (Arenius, Sasi & Gabrielson 2006). Thus, Internet may increase international intensity and global diversity of the firm. Another study showed that SMEs used Internet for gathering of market intelligence and competitor analysis (Loane 2006). They also had developed effective management information systems, and tried to use Internet as a knowledge and resource building tool. Research on Taiwanese SMEs indicated that internationalization pattern of most firms followed the Uppsala model (Jaw & Chen 2006). The degree of internationalization was positively associated with the degree of electronic commerce. Also, the association was stronger, when firms were knowledge intensive. This may imply a greater social capital in knowledge intensive SMEs. Companies have considered web sites as facilitators of internationalization, easing communication and information barriers to exporting (Yamin & Sinkovics 2006). The facilitating effects of online internationalization didn't fully substitute for cultural and business learning, which is associated with physical presence on foreign markets. The concept of virtuality trap was associated with online internationalization. It refers to learning generated through virtual interaction, which obviates the need to learn more about target markets through non-virtual means.

Finally, results among Chinese manufacturing firms indicated that development and usage of e-business systems is important for e-business success and organizational performance (Wu, Zhong & Mei 2011). Further, IT-enabled collaborative advantage was directly enabled by e-business service capability (IT-support provided by e-system), rather than the e-business system itself.

2.3 Organizational learning

Organizational learning theories were analysed by Fiol & Lyles (1985). The authors differentiate between cognitive and behaviour development in an organization. These are different phenomenon, and do not necessarily reflect on another. For example, change in behaviour may occur without any cognitive development.

Argyris and Schön (1996) define organizational learning with the concepts of organizational action, inquiry, and knowledge. Organizational action requires that a political entity exists within an organization, which can decide and act as a collectivity. In the presence of such a collectivity, the individual members can learn on behalf of it. Organizational inquiry refers to the process performed by the collectivity for resolution of doubt, when results of expected actions are not met. The output of inquiry may lead to a change in thinking and acting, which may further lead to a change in organizational practises and create new knowledge. Organizational learning occurs, when the collectivity inquires, which leads into new understanding of organizational phenomenon and restructuring of activities, leading to a change in organizational theory-in-use. Theory-in-use is a theory-of-action, which is implicit in the performance of an activity. Learning results must become embedded in the minds of organizational members or in the organizational environment (maps, memories, programs), in order for the learning to be organizational. (Argyris & Schön 1996.)

Different levels of organizational learning can be identified: lower-level and higher-level learning (Fiol & Lyles 1985). Lower-level learning occurs within a given organizational structure, and a given set of rules. It usually leads to the development of associations between behaviour and outcomes, and is often the result of repetition and routine. It also tends to take place in organizational contexts, which are well

understood, and where management believes in an ability to control outcomes. The desired outcome is usually behavioural or a target level of performance. Lower level of learning has also been referred to as single-loop learning (Argyris 1999). It occurs, when matches are observed between intentions and outcomes, or mismatches are resolved by changing actions without questioning or altering underlying values of the system (Argyris 1999: 68). This level of learning has also been called as instrumental learning, which refers to the effectiveness of achieving intended objectives (Argyris & Schön 1996).

Higher-level learning aims at adjusting overall rules and norms rather than certain activities or behaviours (Fiol & Lyles 1985). It occurs usually in upper level of the organization, whereas lower-level learning may happen on all organization levels. Higher-level learning is also a more cognitive process, and may have long term effects on the organization. The desired consequences are development of frames of reference, interpretative schemes or new cognitive frameworks rather than behavioural outcome. This type of learning has also been referred to as double-loop learning (Argyris 1999). It occurs, when mismatches are corrected by first altering governing variables, which is followed by changing actions (Argyris 1999: 68).

Yeo (2002) has extended organizational learning theory to triple-loop learning, which integrates organizational goals with the learning process. The results showed that considerable time may be required for turning into a learning organization. Strategic positioning and effective leadership can be important factors in direction of organizational learning. Yeo considered organizational learning as a thinking process for conceptualization of new ideas.

Organizational learning has been studied in the context of cloud and lean paradigms (Kuusela, Sirkka & Kuusela-Korva 2013). Results of a case study confirm organizational learning framework by Yeo (2002). More specifically, single, double, and triple loop learning were occurring in the case company, but the link between single and double loop learning required strengthening.

The processes and constructs associated with organizational learning have been studied by Huber (1991). Organizational learning is comprised of knowledge

acquisition, information distribution, information interpretation, and organizational memory, and related sub-processes and sub-constructs.

Nonaka (1991) created a related model for knowledge creation in a company/organization. It consists of four patterns for the creation of tacit and explicit knowledge. Explicit knowledge is formal and systematic, and easily shared with others. Tacit knowledge is personal, and difficult to be encoded and transmitted to other individuals. One of the patterns is the creation of tacit knowledge based on explicit information. In this internalization pattern individuals share explicit knowledge in the company, and use it to broaden, extend, and reframe their tacit knowledge. The four patterns of the model connect dynamically to each other, and form a spiral of knowledge. The model may be considered as another view to organizational learning from the knowledge creation perspective.

Also, other related theories have been created. Absorptive capacity (Cohen & Levinthal 1990) refers to the ability to recognize the value of new, external information, which can be applied for commercial purposes. Absorptive capacity can be used for characterizing innovative performance of a company. Grant developed a knowledge-based theory of organizational capability (1996). The idea is that the main role of a company and the essence of organizational capability is integration of knowledge. Sustainable competitive advantage for a company requires continuous integration of knowledge through either extending existing capabilities with new knowledge, or reconfiguring existing knowledge with new patterns of integration i.e. creation of new capabilities.

2.3.1 Organizational learning and internationalization

Organizational learning has been studied to some extent in the context of internationalization. Transfer of local market knowledge within diversified internationalizing US-firms indicated that organizational learning was a complex process, and varied between companies (Lord & Ranft 2000). The differences stemmed from the nature of knowledge, and differences in organizational structure. Also, tacitness of local market knowledge hindered knowledge transfer between

corporate divisions. This supports the assumption of the Uppsala-model (Johanson & Vahlne 1977), that market knowledge is difficult and costly to acquire.

Organizational learning among small internationalizing UK firms, indicated that different learning processes were associated with phases of internationalization (Anderson & Skinner 1999). Firms with little international experience tended to apply business practises based on ways of working in domestic markets. At the pre-internationalization phase learning focused on individuals and a reactive approach was applied to decision making. Firms at the introduction stage focused on learning of operations and technical requirements at the target market. After initial internationalization at the consolidation stage, learning focused on development of tacit skills for establishment of social/business relationships and cultural empathy. At the reorientation stage learning was generative rather than adaptive, as the firms needed to change organizationally and culturally. Only at this last stage learning of individuals diffused throughout the organization, and double-loop learning occurred (Argyris & Schön 1996).

Hsu & Pereira (2008) presented a conceptual framework, which links economic- and behaviour-based antecedents to performance. The results among American MNEs indicated that product advantage and resources available for international expansion positively affected internationalization. Also, higher level of social and market learning strengthened the link between internationalization and performance, but technological learning didn't. The implication of the research for managers is to understand the company as a knowledge-based entity, instead of only focusing of economic characteristics. The managers should also understand the types of knowledge, which influences performance, and pursue learning opportunities accordingly.

Finally, a complex system model based on organizational learning, innovation, and internationalization has been proposed based on case studies in Spanish clothing industry. In the model organization learning, innovation, and internationalization are partially connected to each other. The system is expected to experience 'edge of chaos/limited instability', which is caused by a shocking situation or decision. Either adaptability or transcendence will take place as a result of the alteration of the

system. It is assumed that attention, inquiry and dialogue take the system to transcendence, whereas concentration, improvement, and discussion take the system to adaptability. Transcendence is associated with radical innovations, generative learning, and global internationalization, while the other route (adaptability) is assumed to lead to low internationalization, adaptive learning, and incremental innovation. (Chiva, Ghauri & Alegre 2013.)

2.4 Performance aspects of internationalization and organizational learning

The effects and antecedents of internationalization and organizational learning on performance have been studied. Earlier research indicates that degree of internationalization is negatively related to domestic learning effort, but not related to international learning effort (Sapienza, Clercq & Sandberg 2005). The results suggest that greater international involvement may be associated with a trade-off to shifting of resources from domestic to international learning. Also, the earlier a firm is engaged in international activity, the greater are the international and domestic learning efforts. Thus, early internationalization may enable a greater learning culture, and more rapid learning and growing both domestically and internationally.

The results of privately-owned firms in Finland's electronics industry indicate that age at entry, and knowledge intensity of the firm were positively related to growth of international sales. The implication of the study is that new firms, which learn in international markets, may have an advantage against older firms, which may build impediments to learning and growth internationally. Imitability of knowledge was positively related to growth in international sales. This may be explained by reduced learning, innovation, and communication as a result of inimitability of knowledge. (Autio, Sapienza & Almeida 2000.)

Another study discovered that diversity of international operations has a positive effect on breadth and depth of technological learning. High control mode of entry may increase speed of technological learning. Integration of knowledge was found to enhance technological learning, when technological diversity of foreign markets was high. Technological learning had a positive effect on performance of the firm. The implication of the results for managers is to identify possibilities for technological

learning and integration of knowledge in order to achieve higher performance of operations, and create a competitive advantage. Also, the effect of international business operation mode on performance should be understood. (Zahra, Ireland & Hitt 2000.)

The association between degree of internationalization and performance from a learning perspective has been studied. A standard-U form relationship was identified between degree of internationalization and performance among German manufacturing firms with FDI during 1993-1997. Profitability decreased until foreign sales to total sales ratio was 60 %, after which profit level rose exponentially. Operating costs also rose until the threshold. The results suggest that firms experienced an organizational learning process, in which the company was internally reconfigured for international operations, and performance deteriorated. Superior performance was gained only after the learning period, when a high degree of internationalization was achieved. Contradictory results have been reported for US-firms, where the shape of the curve was of inverted J-form. This may be explained by different country-specific expansion strategies. (Ruigrok & Wagner 2003.)

Knowledge-based resources and entrepreneurial orientation positively affected performance among SMEs in Sweden. Entrepreneurial orientation moderated the relationship between knowledge-based resources and firm performance. The implication for managers is to encourage innovativeness, pro-activeness, and risk taking regarding knowledge-based resources. (Wiklund & Shepherd 2003.)

The relationship between innovation, organizational learning, and performance has been studied with Spanish firms in manufacturing and service industry. The results indicate that innovation has a significant effect on performance. Organizational learning had a positive effect on innovation and performance. The effect of organizational learning on innovation was larger than the effect on performance. The positive effect of organizational learning on innovation and performance was greater for smaller firms, which implies that bigger firms may depend less on organizational learning processes. (Jimenez-Jimenez & Sanz-Valle 2011.)

The impact of top management support for development of organizational learning and technological skills has been studied with Spanish firms in high-tech services and manufacturing industry (Bolivar-Ramos, Garcia-Morales & Garcia-Sanchez 2012). The results indicated that top management support affected development of technological skills and distinctive technological competences, and organizational learning. Further, organizational learning affected development of organizational innovations, and contributed to organizational performance. The implication is for managers to encourage proactive technological attitude and implementation of new technologies. Also, new distinctive technological competencies can be stimulated by development of technological skills, which can be encouraged with top management support and technological training.

Recently, organizational unlearning has been studied. It refers to discarding of old routines to make way for new ones (Yang, Chou & Chiu 2014). A study among different high technology industries indicated that change dimension of unlearning positively affected creation of radical innovations, but forgetting dimension had a negative effect. Organizational slack (e.g. resources) strengthened the former relationship. The implication is to consider the dimension of unlearning, because it may have an effect on the performance of the firm.

2.5 Summary

Research framework of the study comprises business intelligence, internationalization, exporting, e-commerce and organizational learning theories. Exporting and e-commerce are studied in the context of learning for internationalization. In the following, results of the previous literature study are summarized.

Internationalization is considered as a continuous learning process, in which firms learn from each other in relationships, identify knowledge opportunities, and aim at establishment of a network position (Johanson & Vahlne 2009). Identification and evaluation of export markets may be improved by gaining objective and experiential knowledge (Leonidou & Katsikeas 1996). Technological, social, and market learning has been identified in the exporting context (Yeoh 2004). Learning by exporting may

facilitate innovation (Love & Ganotakis 2013). Exporting may also improve competitiveness as a form of knowledge spillover (Garcia, Avella & Fernandez 2012).

E-commerce may decrease liability of foreignness, and increase the speed of internationalization (Arenius, Sasi & Gabrielsson 2006). Especially, Internet may be used for gathering of market intelligence, conducting of competitor analysis (Loane 2006), facilitating internationalization, and reducing barriers for exporting (Yamin & Sinkovics 2006). Learning via on-line internationalization may also be associated with a virtuality trap.

Organizational learning is considered as learning, which is conducted by a collectivity (organizational unit) on behalf of the organization (Argyris & Schön 1996). Different levels of organizational learning have been identified (Argyris & Schön 1996) (Yeo 2002). Also, constructs and processes of organizational learning have been analysed (Huber 1991). Organizational learning may also be associated with a spiral of knowledge, where tacit and explicit knowledge is dynamically created (Nonaka 1991).

Internationalization and organizational learning have been studied together to some extent. Economic (internationalization) and behaviour (organizational learning) based antecedents to performance have been identified (Hsu & Pereira 2008). Organizational learning phases have been associated with different phases of internationalization (Anderson & Skinner 1999). Also, a complex system model for organizational learning, innovation, and internationalization has been proposed (Chiva, Ghauri & Alegre 2013).

Finally, performance aspects of internationalization and organizational learning have been studied. The results indicate that earlier internationalization may enable a greater learning culture, and more rapid learning and growing (Sapienze, Clercq & Sandberg 2004). Early internationalization may create an advantage against older firms, which may build impediments to learning and growing (Autio, Sapienza & Almeida 2000). Learning and integration of knowledge may increase performance of the firm (Zahra, Ireland & Hitt 2000), but may also deteriorate performance during

the learning period (Ruigrok & Wagner 2003). Knowledge-based resources and knowledge sharing network has increased performance for a large MNE (Wiklund & Shepherd 2003). Organizational learning has had a positive effect on innovation and performance (Jimenez-Jimenez & Sanz-Valle 2011). Top management support has affected development of technological skills and competence, and technological learning (Bolivar-Ramos et al 2012). Finally, organizational unlearning may positively affect creation of radical innovations and performance (Yang, Chou & Chiu 2014).

3 BUSINESS INTELLIGENCE

Business intelligence is characterized as the usage of technologies to enable acquisition and analysis of data to improve decision-making process in a company (Seah, Hsieh & Weng, 2010). BI phenomenon is not new, but has instead been applied in enterprises for decades. The concept of BI is related to knowledge management. BI focuses on explicit knowledge, whereas knowledge management encompasses both explicit and tacit knowledge (Herschel & Jones 2005). Thus, BI can be considered as a subset of knowledge management. Recent technological developments have caused wider usage and acceptance of BI practises. Widespread use of business analytics in all products and services has also been part of business analysts' forecasts (Davenport 2013) (Bughin, Chui & Manyika 2013).

A wide range of benefits may be achieved with BI. Organizational performance can be monitored (Schl fke, Silvi & M ller 2013), time and cost reduction may be sought, new data-based service offerings may be developed, and internal decision making process may be supported (Davenport & Dych , 2013). BI practises may also create a sustainable competitive advantage for a company (Schubert, Williams & Woelfle 2011). In the following recent academic research on BI is presented.

Research directions of business intelligence and analytics have been studied. BI can be roughly categorized into big data analytics, text analytics, and network analytics (Lim, Chen & Chen 2013). Network analytics is a new research area, which focuses on detection of link mining, community detection, and social recommendations.

Additionally, the usage of analytics for heterogeneous web data sources has been studied in the context of Finnish growth firms (Salonen, Huhtam ki & Nyk nen 2013). Particularly, social media presence in Twitter, Facebook, and blogs of growth companies was studied, and related challenges were analysed.

A related approach is horizon scanning applications based on web-based information. Web-based documents were retrieved based on keywords utilized in search engines, and retrieved documents were evaluated in terms of relevance. The solution was

experimented in the insurance industry for performing of risk analysis. (Palomino, Taylor & Owen 2013.)

The role of BI capabilities and decision environments in the success of BI has been studied. The authors tested technological and organizational BI capabilities in a company's decision environment. The results indicated that user access quality, flexibility, and integration of BI with other systems positively affected BI success. Surprisingly, data quality was negatively related to BI success regardless of the decision environment. The results suggest that technological capabilities directly impact BI success regardless of the decision environment. However, decision environment influenced the relationship between organizational BI capabilities and success. (Isik, Jones & Sidorova 2013.)

In addition to academic studies, BI has facilitated business operations in many commercial use cases, which will be presented in the following. Continental Airlines has implemented a real-time business intelligence solution. Continental uses BI for revenue management and accounting, CRM, crew operations and payroll, security and fraud, and flight operations. Real time BI facilitates strategic and tactical decision making and business processes at Continental, which has created revenue enhancements and cost savings for the company. (Watson et al. 2006.)

Facebook, Twitter, and LinkedIn apply analytics tools in the social networking domain. Facebook collects data from end users, which is applied for getting insight of end user behaviour (Thusoo et al. 2010). Twitter does the same based on collected tweets (Mishne et al. 2013). Twitter is also able to offer new services for end users based on the analysed data (e.g. "Who to follow"). Similarly, LinkedIn provides new services (e.g. "People you may know") for end users (Sumbaly, Kreps & Shah 2013). Finally, Netflix provides video recommendations based on their data collection and analysis (Amatriain 2013).

Mobile analytics can be considered as a subcategory of BI in the mobile domain. Mobile analytics systems and their architectures have been analysed (Zaslavsky, Jayaraman & Krishnaswamy 2013). The existing systems differ mainly in terms of

local processing in the mobile device, distributed processing in the cloud domain, and push/pull based interaction between mobile and cloud domains.

Information leakage through the usage of mobile analytics services has been studied. The authors demonstrate vulnerability of the analytics services and mobile advertisement ecosystem. The authors also discuss countermeasures for preventing leakage of personal information. (Chen et al. 2014.)

Mobile crowd-sensing applications refer to sharing and extracting of information about an interesting phenomenon with sensing mobile devices (Ganti, Ye & Lei 2011). The phenomenon may be related to the environment, infrastructure or social context. The analytics functionality is comprised of localized pre-processing of data (within the mobile device), and aggregated data mining in the server infrastructure.

Finally, technology and policy of 3rd party web tracking has been analysed. The authors report current issues regarding regulation and self-regulation on privacy issues in USA and EU. Finally, business models for 3rd party web sites have been presented. (Mayer & Mitchell 2012.)

3.1 Mobile analytics

Several 3rd party tools are available for conducting analytics in the mobile domain. Table 1 presents characteristics of free and commercial mobile analytics tools. The information has been collected from vendors' web sites. The tools have been analysed in terms of pricing model, usage of SDK for data collection, support for mobile platforms/app stores, data ownership, and sharing of collected data with 3rd parties.

The analysis reveals that both free and commercial tools are available. Also, both free and commercial services are available from the same vendor (e.g. AppAnnie, AskingPoint). The pricing model of commercial tools is based on usage (e.g. collected data points, number of tracked applications, number of users, number of app owners), and features of the analytics tool. Usage of a free analytics tool may

also become chargeable, when usage of the tool increases above a specified limit (e.g. MixPanel, HockeyApp).

Almost all of the tools require integration with a Software Development Kit (SDK), which is provided by the vendor of the analytics tool. The published application has to be modified based on the SDK for the purpose of data collection. Most of the tools support the main mobile development platforms. Additionally, some of the tools produce analytics reports based on information provided by mobile application stores (e.g. Google Play, Apple's AppStore), and require no integration with a SDK from the application developer (e.g. Distimo, AppAnnie).

Most tool vendors specify terms for the tools usage in a 'Terms of usage' contract. Privacy aspects of collected data are specified in the 'Privacy policy'. Vendors differ in terms of intellectual property rights of the collected data. In most cases ownership of data is not specified. Some vendors explicitly retain rights of collected data (e.g. Distimo, Yandex), whereas other vendors differentiate by providing ownership of collected data to the customer (e.g. AppSee, AppFigures). Vendors also differ in terms of sharing of collected data with 3rd parties.

Table 1. BI tool characteristics. Information based on vendors' public web sites (04/10/2014).

	Pricing model	SDK	Supported platforms/app stores	Data ownership	Data sharing to 3 rd parties
Flurry	Free	yes	iOS, Android, Blackberry, WP		yes
Medio		yes	iOS, Android, Javascript, REST API	joint	
Google analytics	Free until 10 M clicks/month. Premium version 150000 \$/year	yes	iOS, Android, Javascript		with consent
Localytics	Based on active users and data points (prof vers.). Ent. vers. from 900\$/month	yes	iOS, Android, WP, BlackBerry	Customer	with consent
Mixpanel	Free until 25000 datapoints. pricing based on datapoints	yes	iOS, Android, Javascript		yes
AppWrapper	Free	yes	Android		
Splunk Mint Express	Free until 1000 monthly users. Pricing based on	yes	iOS, Android, WP, HTML5	Customer	yes

HockeyApp	monthly active users and features. Free until 5 apps. Pricing based on number of apps, and number of app owners.	yes	iOS, Android, WP		no
Crittercism	Enterprise license: per device; consumer: free until 30K montly users, pricing based on monthly users.	yes	iOS, Android, WP, HTML5		no
Apsalar	Free. Monthly fee for more features.	yes	iOS, Android		yes
countly	based on number of app sessions. Enterprise version for on-premise analytics.	yes	iOS, Android, WP, BlackBerry		aggregated demographics are shared
Appsee	Premium and enterprise versions.	yes	iOS	Customer (if stored in customer database)	no
Yandex Metrica for Apps	Free.	yes	iOS, Android, WP	Yandex	no
Distimo	free, appiq/conversion tracking are commercial services.	no/yes	iOS, Android, WP, GetJar, BlackBerry, Amazon, Samsung Apps	Distimo	yes
AppFigures	Free for 5 apps. monthly payment for more features/apps tracked.	no	iOS, Google Play, Amazon AppStore, WP	Customer	no
App Annie	Free. Enterprise/Intelligence service is commercial.	no	iOS, Google Play, Amazon AppStore		yes
Asking point	Free. Monetization tools are commercial.	yes	iOS, Android	Asking point	yes
Heatma.ps		yes	iOS	heatma.ps	yes
TestFlight	Free	no/yes	iOS		yes
Live adXTracking			iOS, Android, WP, BlackBerry, Facebook, HTML5		

3.2 Summary

BI has been defined as the usage of technology for data collection and analysis to improve decision making for a company (Seah, Hsieh & Weng, 2010). BI focuses on explicit knowledge, and can be considered as a subset of knowledge management (Herschel & Jones 2005). The benefits of BI have been argued to be time and cost reduction, facilitation for development of new service offerings, and support for

decision making (Davenport & Dyché 2013). Many BI use cases exist. Horizon scanning application for web-based information has been developed (Palomino, Taylor & Owen 2013), real-time BI has been utilized in the airline industry (Continental) for guiding tactical and strategic decision making (Watson et al. 2006), and social networking applications have been utilized for development of new services (Mishne et al. 2013) (Sumbaly, Kreps & Shah 2013). Examples of analytics exist also in the mobile domain. Crowd-sensing applications have been developed for mobile devices, and their architectures have been presented (Ganti, Ye & Lei 2011).

Several 3rd party analytics tools have been developed to the mobile domain. The tools differ in terms of pricing model, supported platforms, requirement for integration with a SDK, data ownership, and sharing of data to 3rd parties. Technology, policy, and regulation of 3rd party mobile analytics services have been analysed (Mayer & Mitchell 2012). Also, the possibility of information leakage with 3rd party mobile analytics tools has been identified (Chen et al. 2014). Finally, research directions for BI research have been categorized into big data analytics, text analytics, and network analytics, (Lim, Chen & Chen 2013), among other approaches. Figure 2 presents how knowledge management, business intelligence, and related research directions and applications are associated with each other, based on the review above.

Figure 3 presents a summarized view of earlier theories, when a firm utilizes BI tools for internationalization and organizational learning. BI/mobile analytics tools should provide explicit knowledge to the organization regarding the usage of mobile applications. The organization should be able to utilize the gained knowledge for learning within the organization, which may include organizational learning processes (Huber 1991) for achieving different levels of learning (Argyris & Schön 1996). The gained explicit knowledge may be transformed into tacit knowledge within the organization. The knowledge may also contain or enable creation of new opportunities, which are potentially useful from internationalization point of view (Johanson & Vahlne 2009). The organization may utilize the knowledge opportunities for making commitment decisions to relationships. Efficient organizational learning and internationalization could also have a positive effect on performance of the company. Finally, the organization may get revenue from in app

purchases, app stores and other third parties (such as advertisement networks), which are related to the theoretical aspects of exporting and e-commerce (Alrawi 2007: 223).

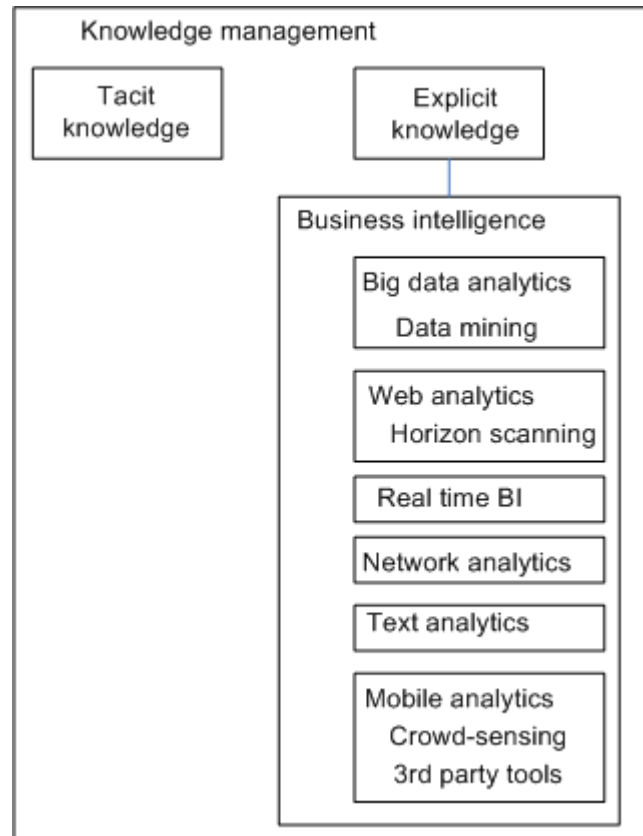


Figure 2. Knowledge management and business intelligence concepts.

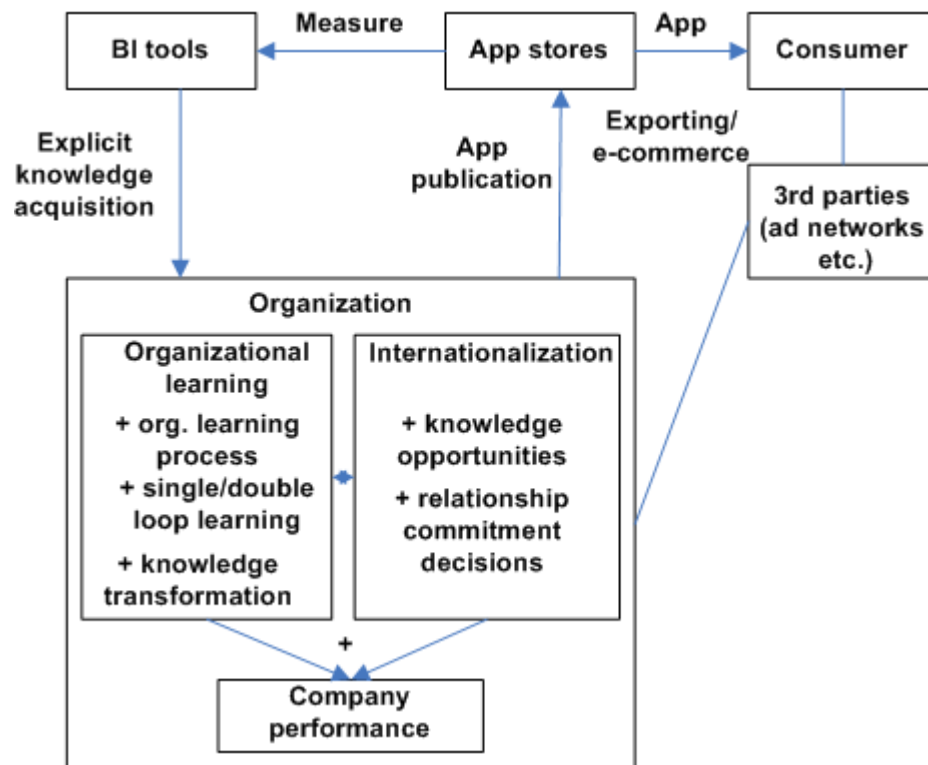


Figure 3. A theoretical view, when BI tools are utilized for internationalization and organizational learning.

4 METHODOLOGY

4.1 Research themes

The main themes of the research are presented in the context of the research questions:

RQ 1.1: *How business intelligence facilitates learning for internationalization?*

Type of knowledge gained – Different type of knowledge is needed for internationalization. Knowledge gained may be experiential market knowledge, which is often gained by execution of foreign operations (Johanson & Vahlne 1977). Also, relationship-specific/network knowledge may be considered as important for internationalization (Johanson & Vahlne 2009). Other types of knowledge important for internationalization may be related to social and technological contexts (Zahra, Ireland & Hitt 2000). Which type of knowledge can be gained with BI tools?

Opportunities gained – Opportunities have been identified as an important determinant for internationalization (Johanson & Vahlne 2009). It is important to identify how BI facilitates identification of opportunities.

Building of network position and development of relationships - The current view of gradual internationalization states that firms depend on ability to build relationships and establish a position in a network (Johanson & Vahlne 2009). Could BI tools facilitate development of relationships and position in a network?

RQ 1.2: *How business intelligence facilitates organizational learning?*

Constructs and processes of organizational learning – Organizational learning encompasses different constructs and processes (e.g. knowledge acquisition, information distribution, information interpretation, organizational memory) (Huber 1991). It is important to understand the relationship between BI tools and organizational constructs and processes, in order to understand possibilities for organizational learning with BI tools.

Types of organizational learning – Organizational learning has been defined as single, double, and triple loop learning (Argyris & Schön 1996) (Yeo 2002). How can BI facilitate different type of organizational learning?

Explicit to tacit knowledge transformation – Nonaka defines a spiral model for knowledge creation in an organization (Nonaka 1991). Can BI tools be used for creation of explicit knowledge, which could be internalized as tacit knowledge in the organization?

Link between organizational learning and internationalization theories – It is important to understand relationship of the theories in the context of mobile application markets and analytics tools. This issue will be approached by studying the relationship between BI tools and related theories separately. Subsequently, the relationship between BI tools, organizational learning, and internationalization theories will be analysed.

4.2 Method

Qualitative research allows gathering of deep information about the phenomenon under study (Yin 2009). This research approach is particularly useful for this study, because the usage of mobile analytics tools is difficult to study outside of the company with quantitative methods. Also, research questions include “how”-statements. Case studies/qualitative methods can provide insight to such questions (Yin 2009). Multiple case studies are executed in a holistic manner (Yin 2009: 46).

Four case companies are studied, which utilize BI tools for development and publishing of applications via application stores. The idea is that the studied companies differ in terms of usage of BI tools, and type of applications published, which should create richer material from the phenomenon. Evidence is collected from two sources. The primary source of data is theme-based interviews (Hirsjärvi & Hurme 2001), which are conducted with important stakeholders of the companies regarding usage of BI tools. Secondary material will be collected from public sources (companies’ web sites, application stores, application store analytics services) for getting information about the companies, published applications, and usage of BI

tools. Data from the primary and secondary sources will be triangulated (Yin 2009) in the analysis process by comparing results of the secondary material to the results of the interviews.

Methodology of the research is described in Figure 4. The content and structure of interviews are created based on subthemes, which have been selected based on a literature survey. The interviews with the case companies will be recorded and transcribed. Subsequently, data from the transcripts of all case companies will be classified within the subthemes of the research. This resembles cross-case synthesis (Yin 2009: 156), where data from individual case studies is aggregated for classification within subthemes. Also, the primary data is compared to the secondary material. The synthesis is compared to literature, and modelled. Finally, a conclusion is made.

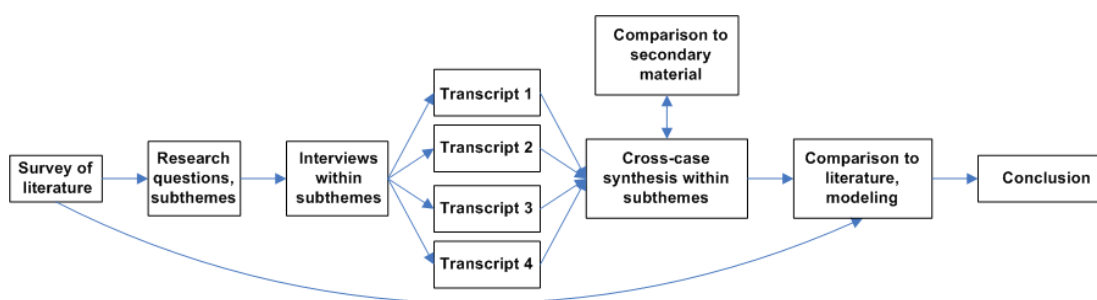


Figure 4. Methodology of the thesis.

Privacy of confidential company information will be maintained, and agreed with the case companies. The results of the study (this thesis) will be provided to key informants of the case companies for review, which should increase validity of the results.

4.3 Case companies

In the following the case companies will be shortly described. Particularly, historical development, products and markets, financial performance, and internationalization of the companies will be focused on. The information has been extracted from public Internet sources (company's web site, Taloussanomat, Fonecta, Distimo, AdMob, Telco OTT, IndieGogo, Arctic Startup) and the interviews.

4.3.1 CaddieON

CaddieON was founded in June 2012 by Mr Juha Pikkarainen and Mr Tuomo Lalli. The main product of the company consists of a wrist band, golf club sensors, a mobile application, and a player portal. The wrist band and sensors collect data from golf players, which can be visualized in the application and player portal. The company sells a physical wrist-band package to consumers via a web store, and via international distributors. CaddieON has started to utilize BI tools for analysis of their customers.

CaddieON has sold the product via their web store, and via IndieGogo platform globally, but mainly in the scope of Europe. The company also has sought distributors for their product in Europe. The company employs 11 persons, and is located in Oulu, Finland. The CEO of CaddieON (Mr Tuomo Lalli) was interviewed on the 9th of October 2014. The interview lasted 1 h 15 min, and dealt with all themes described in the Appendix.

4.3.2 Fingersoft

Fingersoft was founded by Mr Toni Fingerroos in 2012. The company develops and releases games for mobile phones via application stores. After developing and publishing camera applications for mobile users, the first game (Hill Climb Racing) was released by the company in September 2012. The game became very popular, and it has been downloaded more than 200 million times from the application stores. In addition to developing and releasing games developed by Fingersoft, the company collaborates with other game corporations. The company publishes games, which have been developed in collaboration with their partners. Particularly, the company shares revenue with their partners from the games, which are published in collaboration. Fingersoft also promotes the collaboratively released applications (called in app cross-promotion). Fingersoft has published more than 10 applications via GooglePlay, AppStore, and Windows Marketplace.

The most significant sources of revenue for the company is created by in app purchases, and advertising revenue. Advertising revenue is based on collaboration with advertisement networks such as AdMob. In practise, Fingersoft gets revenue when advertisements are displayed for end users in the applications. The company also has a web store for selling of merchandise for their most popular game (Hill Climb Racing). In 2013, the company made 15.52 M€ revenue with 9.42 M€ profit. The company employs 11 persons, and it is located in Kempele, Finland.

The company's business operations are international, as applications are published globally in more than 100 countries. The company also collaborates with large international corporations such as mobile device manufacturers, advertisement networks, and application stores. Fingersoft utilizes third party analytics tools in the development of their games. The business development director of Fingersoft (Mr Jarkko Paalanen) was interviewed on the 14th of October 2014. The interview lasted 1 h, and dealt with all themes described in the Appendix.

4.3.3 Jongla

Jongla was established in September 2009. JonglaFree application was released in 2010, which enabled free sharing of messages, pictures, and videos for Symbian and Java enabled mobile phones. Based on the initial experiences, Jongla developed an instant messaging application for iOS and Android platforms. The application was published via AppStore in October 2012. Subsequently, the application has been published also via other application market places. The mobile service has been very successful. The company was the winner of Red Herring 100 Global award in 2013.

Jongla gets revenue from in app purchases. Jongla's biggest markets currently are in Far East, and largest customer-base is in Thailand. Jongla collaborates with media houses, and network operators for building of brand awareness, and enhancing of end user experience in foreign locations. Jongla has an office in Singapore. The company employs 17 persons, and it is located in Helsinki, Finland. Jongla utilizes 3rd party analytics tools in the development of their application. The CEO of Jongla (Mr Riku Salminen) was interviewed on the 24th of October 2014. The interview lasted 29 min. The following sub-themes were focused on: internationalization and knowledge, type

of knowledge for internationalization, relationships for internationalization, network position, constructs and processes for organizational learning, and type of organizational learning.

4.3.4 Createtrips

Createtrips was founded by Mr Juha-Petteri Kukkonen. The company released an application for travel planning via AppStore in New Zealand in December 2013. The application was released in other Middle East countries in May 2014. The application was released globally in July 2014, and was in Top 10 position (in travel application category) in 75 countries.

Createtrips application facilitates travel planning for end users. Createtrips also collaborates with bloggers, who create content to the service as mini travel guides. The company also partners with hotel chains for promotion of the application, and for creation of travel guides. Createtrips gets revenue from in app purchases. For example, mini travel guides and offline usage of the application can be purchased at foreign locations. The revenue from mini travel guides is shared between Createtrips, and the creator of content (blogger, hotel). The largest customer group for Createtrips is located in Near East and Asia-Pacific regions. Createtrips utilizes 3rd party analytics tools in the development of the application. The company employs 11 persons. Createtrips is located in Helsinki, Finland. The founder of Createtrips (Mr Juha-Petteri Kukkonen) was interviewed on the 24th of October 2014. The interview lasted 49 min, and dealt with all themes described in the Appendix.

5 RESULTS AND ANALYSIS

In this chapter results of the semi-structured interviews will be presented and analysed. First, international operations of the case companies are described in section 5.1. Subsequently, the results of the interviews are presented and classified within the theoretical subthemes of internationalization and organizational learning (sections 5.1.1-5.1.5 and 5.2). Finally, the results will be analysed and modelled within the theoretical frameworks (section 5.3).

5.1 Internationalization

Figure 5 presents the main actors and relationships, which are essential in the international business operations of the case companies. First, all companies have developed applications, which are published and distributed via application stores for international customers/end users. Most of the companies see them as born global companies, which is enabled by the application stores as a distribution channel:

Fingersoft (Paalanen): *“99.8% of our business is international.. We are basically a born-global company. Finland's share of revenue is probably only a few percentile.. We don't see a difference between domestic and international business.”*

Jongla (Salminen): *“Jongla is a global service. It has been published via AppStore globally. Our user base is fully international.”*

CreateTrips (Kukkonen): *“Basically our business is only international.. near-East and far-Asia are the most significant single regions”*

The most important customer base (B2C relationship) for the case companies is end users of the applications. An important source of revenue for the companies is generated by in-app purchases performed by end users. As an example, customers of CaddieON can buy course maps inside the application. Also, Fingersoft, Jongla, and CreateTrips offer additional application features with in-app purchases. The transactions can be considered as exporting revenue for the company.

Advertisement networks enable another source of exporting revenue for the case companies. When an advertisement is displayed in the application for the end user, the company gets revenue from the advertisement network. Additionally, the advertiser pays to the advertisement network, which acts as an intermediary between the company and the advertiser.

Other important B2B customers for the case companies in terms of internationalization are mobile device manufacturers, network operators, and media houses. For example, Jongla has partnered with operators and media houses to improve user acquisition and making their brand more well-known.

CaddieON's product concept includes a physical wrist-band package. Distributors in foreign locations are an important sales channel for CaddieON for increasing their level of internationalization by exporting. Another important actor in terms of internationalization for CaddieON has been a crowdsourcing platform, which has enabled international orders (Europe, Asia, North-America) for the company.

The case companies utilize 3rd party analytics tools for getting information about their customers/end users. Access to the analytics tools is provided with Software as a Service (SaaS) –model, where the analytics service is executed in the tool provider's cloud infrastructure, and analytics dashboards are utilized for visualization of collected statistics. Additionally, data may be collected to a cloud service, which is managed by the company. A crowd-sourcing platform may also provide analytics dashboards for a company.

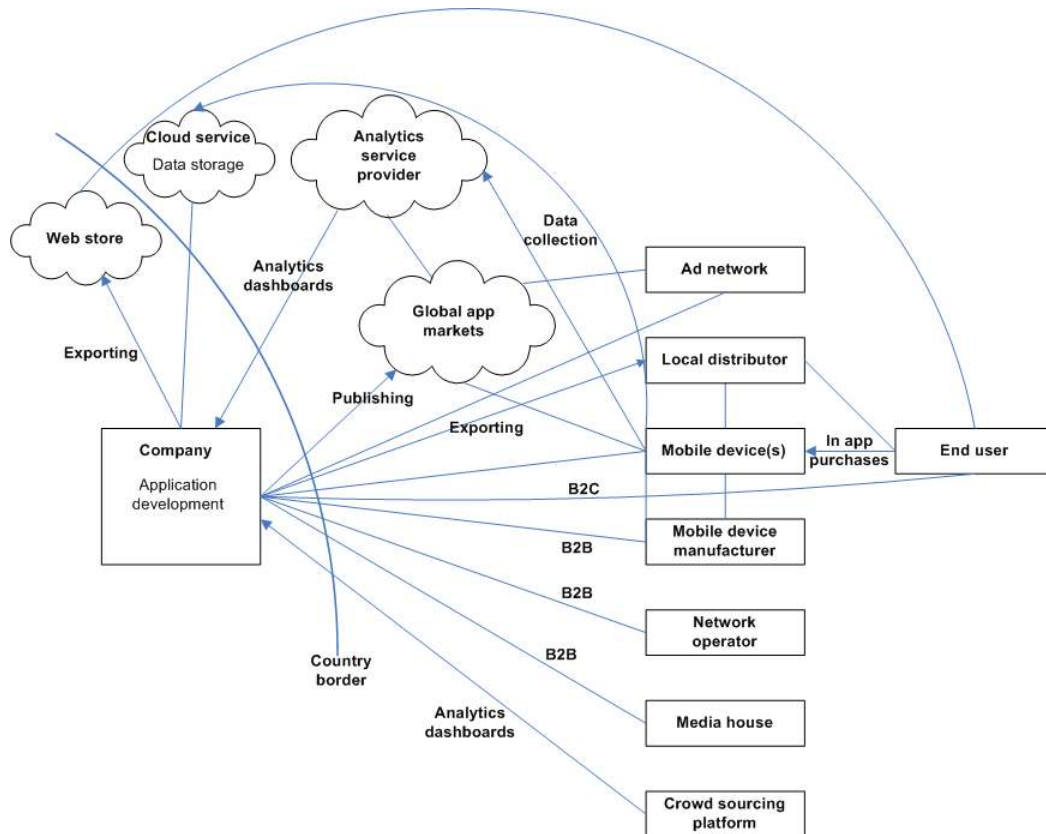


Figure 5. Main actors and relationships in the case companies' internationalization.

5.1.1 Internationalization and knowledge

The companies were asked questions about knowledge relevant for internationalization, and learning process for internationalization. Regarding knowledge important from the point of view of internationalization, the results may be broadly categorized into market knowledge, and knowledge related to international differences. CaddieON considered knowledge of golf business as important market knowledge. Also, connections to partners for distribution and marketing of their physical product were considered as important. Fingersoft values knowledge related to the game ecosystem and to the global application market. Usage of the application, feedback from end users, and end user ratings are important knowledge for Jongla for improvement of user experience in a target country. Jongla also utilizes information of application usage for evaluation of business potential in a target country. Createtrips sees all collected information with analytics as important from the point of view of internationalization. In order to understand usage of their application, Createtrips values source and destination location of users as an

important indicator how trips are created in their application service, which increases their understanding of end users and important markets.

The companies also highlighted international differences as important knowledge. CaddieON has to understand differences in legal issues, when signing agreements with their partners. Fingersoft has to understand regional differences in application market places and channels. Also, differences in international taxation are important in terms of operational business i.e. accounting for Fingersoft. In terms of their products (games), it is important to understand cultural differences:

Fingersoft (Paalanen): *“There are a lot of cultural differences, when you implement games or creative content. For example, what works in USA may not necessarily work in Japan, and really doesn't work.”*

Type of knowledge important for learning about internationalization can be divided into B2B relationship specific knowledge, and end user/consumer (B2C) related knowledge. CaddieON considers knowledge of potential partners for distribution of their product as important. Fingersoft also has international B2B partners, and emphasizes the importance of understanding cultural and regulatory differences between countries. Another important source for international learning is analytics, which is mainly used for understanding usage of applications i.e. getting consumer related knowledge:

Fingersoft (Paalanen): *“When you think about the products we make (games), on that level the most important thing is to know and to analyse, which kind of products work on a certain geographical area, and what people like in a location.”*

Jongla (Salminen): *“In the app business we look at usage of the application. From which countries it comes from. How much is it used there, how is it used there. With which user terminal is it used. Via it we go through ratings provided by users, feedback..”*

Createtrips (Kukkonen): *“The data about where people come from, and where they don't come from. From there we see directly, where this kind of app creates interest.”*

Even though knowledge received with analytics is seen as important, it may not provide all important knowledge. The company may also gather information about the local user experience in a country for the improvement of applications:

Jongla (Salminen): *“When we think how we can internationalize, the information comes, when you go into the country. This is only the background.. we have expanded, recruited a local person from there, to work locally, for testing and understanding the local user experience what exists there.”*

When asked about the process for learning about internationalization, many different sources of knowledge were identified. Most companies learned from the Internet. For example CaddieON searches the Internet for potential distribution partners. Fingersoft learns by finding and reading research articles from the Internet. Another important source for learning is relationships with B2B partners. Fingersoft exchanges experiences with other game companies, and CaddieON learns from partners' networks. Experimentation in application development is seen as part of a daily learning process:

Fingersoft (Paalanen): *“The most important thing is that you learn by doing. You have to try and fail, especially when implementing the game, the process contains it. We experiment, and when it doesn't work, we change, and look at analytics, what went wrong.”*

Createtrips (Kukkonen): *“It is based on learning the hard way.”*

Finally, most firms learn from end users by utilizing analytics tools. They also consider usage of analytics and learning from end users as essential due to the tight competition in application stores:

Createtrips (Kukkonen): *“This is really difficult, it is really competitive.. It is painfully challenging. Unless we had really good analytics, we wouldn't be able to do it ever.”*

Jongla (Salminen): *“We are in a business, when we are daily as good as our latest version in AppStore, thus the feedback is always immediate, and very raw.. This is constant learning. Our team learns, grows, develops. What is important, we learn from our end users.”*

5.1.2 Internationalization and analytics

The case companies utilize different 3rd party analytics tools for facilitating development of applications. CaddieON uses analytics offered by Google Play for monitoring of application downloads. Additionally, CaddieON utilizes Google Analytics for monitoring of usage in their web store. Fingersoft uses 3rd party tools for getting information about behaviour of players. Fingersoft also utilizes game monetization related analytics tools. Jongla has integrated Localytics to their application for monitoring of end user behaviour. Jongla also uses Google Analytics for monitoring of web usage. Createtrips uses Flurry for monitoring of end user behaviour.

The companies may also use their own server infrastructure or cloud infrastructure for data collection from end users. CaddieON collects statistics and played rounds from users to their own cloud service. Jongla monitors usage of end users by collecting data to their own servers.

The companies were interviewed on the usage of analytics tools regarding type of knowledge gained, and learning for internationalization. The gained knowledge is utilized for different purposes. First, an important goal is to understand end user behaviour and needs, and aggregated statistics based on them. For example, CaddieON uses GooglePlay for geographical analysis of application downloads, and Google Analytics for monitoring of user visits to their web store. CaddieON also utilizes collected data for analysis of player statistics. Fingersoft uses analytics mainly for understanding satisfaction of end users and functionality of games:

Fingersoft (Paalanen): *“From the whole business perspective, how the games function, do people like them (or not), what people like, and what people do not like. That is the basis for our business. That is the core analytics for us, the analysis inside the product.”*

Another important indicator for Fingersoft is retention. It describes how often the game is used by end users. They also analyse geographical distribution of players to see where downloads come from, and for analysing time of the day their games are played.

Jongla also utilizes analytics for tracking user behaviour inside of application, and for understanding retention:

Jongla (Salminen): *“We can look really accurately what happens inside the app, when a person comes and registers there .. Analytics on returning customers is very important, how they use the service, from which page they move to where.”*

Createtrips utilizes analytics for understanding demographical distribution and retention of their users:

Createtrips (Kukkonen): *“Demographics, we have really accurate. We can based on age, place of living, based on routines, we can classify in any way we want to .. In terms of single information, which is really important for us, is how often a person returns to our service, the so-called retention.”*

The second important purpose of knowledge gained with analytics is to understand the impact of marketing operations. CaddieON has tried to analyse the impact of marketing operations on the count of application downloads. Fingersoft wants to understand how end users find their games, especially based on marketing operations such as posting on Facebook. Jongla monitors how an end user becomes a customer, which is important for user acquisition.

A third purpose of knowledge gained with analytics is to monitor monetization related aspects:

Fingersoft (Paalanen): *“When we analyse how purchases inside the game have happened, we can take a look, what are the most popular packages (two, four or ten dollar(\$)). Business level has its normal analytics. We follow how advertising revenue evolves, and different sources of revenue evolve.”*

Finally, analytics may also improve quality of service or create new possibilities for a company. CaddieON sees potential use of analytics for the creation of new offerings with their own future partners (e.g. golf clubs or golf equipment manufacturers). CaddieON also expects to utilize analytics for building of credibility in business negotiations. Createtrips utilizes collected data for providing better recommendations for their customers.

When asked about knowledge most important for learning about internationalization, interest lay in understanding of consumer usage in a target country, and understanding of important markets for the company:

CaddieON (Lalli): *“all kind of information, which is related to customer behaviour, is most valuable, what we can collect.”*

Fingersoft (Paalanen): *“Definitely, what works on different parts of the world.”*

Jongla (Salminen): *“That you know in which country the app is being used at, which are your main markets, and how it is being used.”*

Also, the big picture of analytics and user experience is seen as important for learning:

Createtrips (Kukkonen): *“This is wholeness business. A single number doesn’t make you blissfull, except sales.. People have to enjoy in the service, it is the starting point. People have so short time span these days, when it has been taught the consumer to it. If you cannot find from the web service, immediately what you are looking for, you go to the competitor. It is the same thing with apps.”*

5.1.3 Opportunities for internationalization

The companies were asked about opportunities for internationalization, sources for opportunities, usage of analytics for gaining opportunities, and related barriers. The application stores enable global exporting of applications, which is the main enabler of opportunities for internationalization:

Fingersoft (Paalanen): *“In this business the presence of app stores (Apple’s AppStore and Google Play) already enables a global presence, except for China.”*

Overall, opportunities for internationalization were mainly seen in relationships with B2B partners. Fingersoft sees as an important opportunity finding of the right local partner for distribution of applications, in areas, which cannot be operated via global application stores (e.g. China). CaddieON also considers finding of the right partner from a certain geographical area for distribution of their product as an important opportunity. Personal networks and networks of networks have been important sources for gaining internationalization opportunities for CaddieON. Also, social media channels and crowdsourcing campaigns have been a source for getting into contact with potential partners for CaddieON. Createtrips sees opportunities in B2B customers (hotel chains), which can promote their application, and create content to their service. Also, travel bloggers are considered as important for promotion and creation of traveling content to the service. Createtrips utilizes travel blogging and traveling events for networking with potential partners.

Due to the huge success of Fingersoft’s games, the company gets a lot of unsolicited offers:

Fingersoft (Paalanen): *“The games have been downloaded more than 200 million times, and the industry has noticed it. In practise, we quite rarely contact anyone, we do it very few times during the year. In practise, we have a flow of contact requests.”*

However, Mr Paalanen realizes that normally they would build a contact network via game conferences, and other game companies.

Analytics tools may also be utilized for gaining opportunities for internationalization. Potential was seen in the usage of analytics for facilitating negotiations with partners (CaddieON), by studying demographics of users (Fingersoft), and analysing geographical interest for content and finding out the impact of marketing operations (Fingersoft):

CaddieON (Lalli): *“When we have reached negotiations, we could persuade the opposing actor or as a basis for negotiations, we could utilize the data we collect with business analytics.”*

Fingersoft (Paalanen): *“The most direct and easiest example is searching of statistics from services such as AppAnnie.com.. We can see where money moves at, which age and which gender uses money, and where.”*

Fingersoft (Paalanen): *“We know how games are distributed in different countries.. In terms of marketing, if you search for audience from some region for a game product, based on analytics we know what is the most effective way, with a dollar you get the largest amount of downloads.”*

Fingersoft sees the biggest opportunity enabled by analytics as the possibility for targeting specific applications to specific regions. Createtrips can utilize data, which has been gained collected with their pilot partners in the negotiations with future partners. Createtrips also sees data itself as the most important opportunity:

Fingersoft (Paalanen): *“You can modify your product to be suitable for a certain region based on analytics.”*

Createtrips (Kukkonen): *“With a hotel chain it went like, when one hotel started piloting, three weeks went, which went quite well. We received three more hotels to it, because we were able to show, this gets downloaded a lot, and people spend time with this a lot, that helps. That is all information, which is received from analytics.”*

The companies do not see significant obstacles in the usage of analytics. Fingersoft highlights that analytics describe past behaviour:

Fingersoft (Paalanen): *“They tell the situation today, or yesterday, or the day before, they don't predict the future..You cannot implement a successful game only based on analytics, coldly based on mathematics. It includes a lot of creativity, luck, and other things.”*

5.1.4 Relationships for internationalization

The companies were asked about their most important relationships, learning from relationships, commitment to relationships, usage of analytics for development of relationships, and barriers related to the usage of analytics for relationships development. The most important customer relationships for internationalization can be categorized broadly into end users/consumers of applications, and B2B customers. Fingersoft considers consumers, who play their games, as their most important customer. Jongla's main customer base consists of end users of their service enabled with any terminal. Createtrips's most important customers are end users of their application.

CaddieON is interested in B2B partners, which can operate widely for distribution of their products. Fingersoft considers mobile device manufacturers, application stores, and advertisement networks as important B2B customers. Jongla co-operates with operators and media houses, for end user acquisition and branding. Createtrips considers B2B partners (e.g. hotel chains) as important for promotion purposes of their application.

The companies learn from their end user relationships by utilizing feedback provided by end users, and by utilizing analytics tools. Createtrips can also learn from the content, which is created by the end users to their service (i.e. mini travel guides). When a company learns based on feedback and analytics, user experience of the application can be improved, especially from the quality point of view:

Jongla (Salminen): *“The most important things are issues related to the introduction and usage of the service. Via it a common factor is quality, improvement of quality.”*

In B2B relationships, companies learn from personal relationships:

Fingersoft (Paalanen): *“Personally based on the person working on a customer account. And the learning is shared within the company.”*

Jongla (Salminen): *“Always, when you do co-operation, you learn, because persons are involved with each other, and learn from each other.”*

Jongla also learns from the public profile of a partner, when it does marketing related co-operation. Fingersoft learns from a B2B customer important technical information, which may affect their own product development. When personal relationships are created with B2B partners, building of trust becomes as the essential factor in customer relationships (CaddieON):

Fingersoft (Paalanen): *“Partner X tells to us, what kind of technical changes are coming to the systems, how you should prepare, and tells both ways.. Usually it is bi-directional, trust-based sharing of information, where the world is going to.”*

CaddieON (Lalli): *“Maybe building of trust as a basis for the customer relationship. It takes a surprisingly long time. It is a much longer period of time what I originally thought.”*

The companies are committed to customer relationships in terms of end users and B2B customers:

Fingersoft (Paalanen): *“We are very committed. The important customer is the one who plays the game. Without the players, the company wouldn't exist. We definitely listen to feedback, provide support, we answers to questions.. The biggest partners with which we collaborate with.. we constantly keep contact, and visit each other, and see each other in conferences. Also, personal relationships get created, which facilitates business a lot, immensely, when we meet people, not just via e-mail.”*

Createtrips (Kukkonen): *“We are nothing if we don't have users.. When people come to it, they have to enjoy there. If they don't enjoy there, we don't have anything.”*

Jongla (Salminen): *“Always when we sign a contract, and start to implement a partnership, it demands commitment. We have responsibilities and duties, and from partner, and we work towards common goals.”*

The role of analytics in customer relationship development can also be analysed from the end user and B2B customer viewpoints. The value of analytics is seen as essential for development of relationships from end user point of view. Analytics may also play a part as a facilitator in the development of B2B relationships:

Jongla (Salminen): *“It is everything. In mobile you track everything, and everything is based on measurement and analytics. The question seems funny, because it is baked into the backbone.”*

CaddieON (Lalli): *“I could well imagine that when you think about customer relationships and building of trust and continuous keeping of contact.. if the tools would leave a trace what we have done.. we could utilize in such a way that we would get reminders that call to this guy now, we haven't been in contact with him in a while.”*

Jongla (Salminen): *“In this kind of model, when we rely on partners, analytics is everything. No one will start into this business marketing something, apps, if we cannot provide facilitative numbers, where were we now, and where are we after marketing,”*

There are also other views to the use of analytics for development of B2B relationships:

Fingersoft (Paalanen): *“If I think about B2B relationship we have, I don't know..Customer relationships in B2B context are based on personal chemistry, co-operation, and trust, more than on analytics.”*

The obstacles in the usage of analytics for customer relationship development were related to lack of competence of analytics tools, resourcing of personnel, and lack of real-time performance of the analytics tools.

5.1.5 Network position

The companies were asked about the importance of a network position in terms of competitors and customers. Subsequently, it was queried how a network position is developed, and what is the role of analytics in it. In overall, the case companies aim at an optimal position in terms of competitors or customers. It was emphasized that competition in application markets is really tough. The companies described network position in terms of competition:

CaddieON (Lalli): *“I would say that we aim at getting a certain market share from the devices golfers are using while they are playing. We are competing against other GPS-based physical devices, plain apps, GPS watches and laser rangefinders. On a longer term, we want to be world number one in game tracking product category”*

Fingersoft (Paalanen): *“We have a statement, we want to be the best indie mobile games publisher in the world, some day.”*

Jongla (Salminen): *“Mobile instant messaging is a very competitive business.. When we think about the users of Jongla, markets which rise, and where we put effort to, of course we look at strong competitors there in the same market, and why are they strong. Via it, we think about the market share they have and how we can reach.”*

Createtrips (Kukkonen): *“Our purpose would be the best, most used, downloaded traveling app, because only then you can make money with this thing.”*

The exception in terms of competitive pressure on network position was Fingersoft:

Fingersoft (Paalanen): *“In terms of competition, we don't think a lot about competition..We don't measure competitors, or try to compete with anyone. We do*

our thing..Of course networking is important to us. The more you know people, entities, companies, operations models, it has an effect on all.”

Various practises were mentioned for development of a network position. CaddieON focuses currently on product development, building of the infrastructure, and finding the right partners for distribution of their product. Fingersoft develops a network position organically with usual business operations, and by utilizing unsolicited opportunities such as invitations to speak in a conference. Createtrips has a fast software development cycle, in which feedback and analytics is utilized for improvement of the application.

Analytics can be utilized in several ways to establish a position in a network. Jongla utilizes analytics daily, and discusses them on a team level weekly for improvement of their application. CaddieON sees potential in the utilization of analytics, when approaching new partners. Also, CaddieON expects analytics to offer opportunities for increasing impact of marketing, increasing of sales, and creating awareness in the customer base.

Application stores also utilize analytics for ranking of applications. Network position in terms of ranking in the application store may be improved:

Jongla (Salminen): *“Position in a network comes cleanly from app stores’ own analytics, algorithms, and you try to influence into it, and we talk about app store optimization.”*

Also, the application industry may be analysed with analytics tools (e.g. AppAnnie (Table 1)). Analytics were also seen in a small role for the development of network position in terms of B2B relationships (Fingersoft).

5.1.6 Comparison to literature

Application stores enable global exporting of applications and related transactions (e.g. in app purchases). Thus, the case companies have a low barrier of entry, and are able to instantly start international operation for exporting. This was also reflected in

the interviews, as most of the companies considered them as born-global companies. The most important customers to the companies are end users, but relationships to B2B partners are seen as important from internationalization point of view.

Companies often acquire market knowledge for internationalization. Market knowledge is defined as information about demand and supply, competition, channels for distribution, and differences between countries (Johanson & Vahlne, 1977). The case companies identified several kinds of market knowledge and cross-country differences as important knowledge for internationalization. Social (e.g. feedback of end users) and technological (e.g. Fingersoft's learning from partners) knowledge was also learned by the companies, which has been seen as important in the earlier internationalization literature (Zahra, Ireland & Hitt 2000).

In the later version of the Uppsala-model (Johanson & Vahlne 2009), learning is identified a changing factor in the internationalization process. The results indicated that learning is also a central changing element in the internationalization process of the case companies. Especially, the companies identified knowledge related to customers/end users and B2B customers as important knowledge for learning about internationalization. The companies also identified several sources of knowledge for learning about internationalization. Learning from business partners has been important in the internationalization model ((Johanson & Vahlne 2009)), but learning based on analytics tools can be considered as a new source of knowledge.

Analytics tools were utilized for different purposes in the international operations of the companies. First, knowledge related to consumers' behaviour and needs can be acquired. Second, the impact of marketing operations can be understood better. Third, monitoring of monetization aspects of applications can be facilitated. Fourth, BI tools can be used for improvement of quality of service, and creation of new opportunities for the company. Finally, a company can utilize BI tools for understanding important markets, and consumer behaviour in a target country. The purpose of knowledge gained with analytics may be considered as novel information in relation to internationalization literature, but not in the literature of technological development (Mayer & Mitchell 2012) (Ganti, Ye & Lei 2011).

In the internationalization process knowledge opportunities are a subset of knowledge, which may lead to change in the internationalization i.e. commitment to relationships (Johanson & Vahlne 2009). The companies saw opportunities in the development of relationship with B2B partners, which is similar pattern as in the model of the Uppsala-model. Also, several opportunities can be found by utilizing BI tools. BI tools can be used for building credibility for B2B negotiations. New opportunities may be acquired by studying of demographics of consumers. BI tools may also be utilized for understanding what kind of content is interesting in a geographical region. When target markets are understood, specific applications can be targeted into specific regions/countries. Data gained with BI tools may also be considered as an opportunity in itself. The sources of opportunities and usage of analytics for gaining of opportunities can be considered as complementary information, when compared to the literature on internationalization.

Internationalization model includes commitment to relationships or networks of relationships (Johanson & Vahlne 2009). The case companies also identified relationships and commitment to end users and B2B customers as important for internationalization. Trust was seen as an important element in development of B2B customer relationships (e.g. CaddieON), which is also part of the internationalization model (Johanson & Vahlne 2009). The companies learned from their B2B relationships, which may correspond to learning “relationship-specific knowledge” in the Uppsala-model (Johanson & Vahlne 2009). Also, the companies learned from end users with analytics, which can be considered as additional learning in the context of application stores. The results indicated that analytics may be utilized also in the development of B2B relationships, which are important for internationalization.

Internationalization is seen as an outcome to strengthen a network position (Johanson & Vahlne 2009). Similarly, the companies regarded achievement of a network position as important, especially from the point of view of high competition in application stores. The companies try to achieve an optimal network position by development of relationships with B2B partners (e.g. CaddieON), and product development where analytics tools facilitate management of the company and development of applications. A network position was also seen a part of a ranking in

application stores. The ranking may also be optimized with analytics (app store optimization (Salz 2014: 54-56)).

5.2 Organizational learning

5.2.1 Constructs and processes

The role of analytics in the organizational learning process was analysed in terms of acquisition of knowledge, and distribution, interpretation, and storage of information. Also, possible barriers in the usage of analytics for organizational learning were queried. Organizations of the case companies have several means for knowledge acquisition. Individuals of the organizations acquire knowledge by searching the Internet, by monitoring specific forums, and newsletters. Also, open source development and communities are followed, and external training courses may be offered for individuals. Companies also acquire knowledge from business relationships:

Fingersoft (Paalanen): *“most of it is verbal, by talking with partners and others, in meetings. Most of the information is based on it, the seeds.”*

Analytics are utilized in daily product development work, as it brings knowledge on feedback and usage of end users to the organization. Analytics may also bring knowledge on the outcome of application design decisions to the company:

Createtrips (Kukkonen): *“Every change, which we implement to the app, it must be verified in couple of weeks, that it was a good change.”*

The barriers in knowledge acquisition to the organization with analytics were related to lack of personnel (resources), technical problems with analytics tools, and lack of real time support in the analytics tools.

Acquired knowledge was shared in multiple ways in the organization. Individuals share interesting knowledge on an ad hoc basis between individuals, in meetings or via the network drive. Also, video connections and chat tools between personnel in

international locations are applied for facilitating sharing of knowledge. The importance of knowledge sharing within a team is emphasized at Jongla:

Jongla (Salminen): *“Knowledge is nothing, if it is not shared. If we don't talk, and look how it is understood. Here comes this, that we are a team, we do team work, we do work for one common thing, and that is Jongla. And shared information is knowledge.”*

The organizations utilized analytics for information distribution mostly by sharing the information, which can be visualized in the dashboards of analytics tools. Analytics may act as an impartial source for verification of decisions in the organization. The barriers in information distribution may be related to the diversity of persons working within the organization:

Jongla (Salminen): *“Analytics is an impartial source, when we display them to the board.. Analytics show how well we have learned, and how well we have implemented, have we made the correct conclusions based on it, and have we corrected the right things, and focused on the right features.”*

Fingersoft (Paalanen): *“Challenges are that different persons with different profiles are interested in completely different things..In terms of information distribution, very rare things are seen as “must to know” for everyone.”*

Knowledge acquired with analytics is interpreted daily in most of the case companies, which utilize analytics tools. Analytics may have an effect on all important decisions made in the company (Createtrips). However, analytics may also be interpreted less often (Fingersoft):

Createtrips (Kukkonen): *“We make all the important decisions via it, on how we should develop our product.”*

Fingersoft (Paalanen): *“Regular observation of analytics with this kind of group may not be sensible. A lot of data exists, but it is looked at from time to time. We may not*

check some dashboards even for months, then we take a look at what has happened there.”

The barrier in interpretation of knowledge gained with analytics may be related to the amount of information available (see Fingersoft’s quote above).

The storage of information gained with analytics depends on the analytics tool. When 3rd party analytics tools are utilized, historical data is saved automatically to the infrastructure of the analytics tool provider. However, also a company’s own or cloud infrastructure may be utilized for data storage. Collected reports from analytics may also be saved into computers of organization’s individuals. The possible barrier in data storage with 3rd party analytics tools is seen in the ownership of data:

Fingersoft (Paalanen): *“The downside with 3rd party tools exist, that someone else owns the data, it isn't exclusive to you. But, we haven't thought it to be a problem for us.”*

5.2.2 Type of organizational learning

The companies were interviewed on their learning as an organization. Subsequently, they were asked to describe one important event where they had utilized analytics tools for organizational learning, what they had learnt, and what had changed as a result of the learning. Finally, barriers in organizational learning with analytics were queried.

The companies described organizational learning in various ways. First, individuals of an organization gather knowledge, which is shared with others. The information is shared informally, and in meetings. Also, a common group-based email address is used for distribution of customer-related knowledge within an organization. A common way of learning in the organization is trial and error. The companies perform experiments, and utilize analytics tools for analysis of experiments. All of the companies were able to report one event of organizational learning, in which they had utilized analytics tools:

- CaddieON experimented the impact of different marketing mechanisms (emails, blogging, press releases) on traffic and sales on a crowd-funding platform. The company learnt the most effective way to perform marketing based on the analytics provided by the crowd-sourcing tool. As a result of learning, more weight will be put on the most effective marketing mechanisms in the future.
- Fingersoft experimented with special offers in the form of in app purchases on special days. The organization learnt based on analytics, that special offers work financially. Also, product development of the company learnt that in the future capability for enabling special offers should be included to the implementation.
- Jongla has learned issues related to customer relationships such as user retention, and loyalty based on analytics. The company has learned to improve introduction of the service for the end user.
- Createtrips experimented with a feature, which was outside of the core functionality of the application. Based on analytics the company has learnt, that the particular feature is used a lot. As a result the feature will be developed also in the future.

The only reported barrier in the usage of analytics for organizational learning, is scattered information in different analytics tools:

CaddieON (Lalli): *“Crowdsourcing platform offered us analytics. On the other hand we have Google Play store related stuff we get from there, and we have as one data source our own database, which we can utilize, they are a bit scattered. It is time consuming to gather the information.”*

5.2.3 Knowledge transformation

The companies were interviewed about knowledge transformation based on analytics tools. Especially, knowledge internalization and development of new based on internalized knowledge was focused on. Knowledge from analytics was learned mostly on a personal level. Some of the knowledge provided by analytics can be internalized instantly, but other information requires additional data collection and reflection:

Fingersoft (Paalanen): *“Analytics can also show wrong, depending on the day, and time of the day. If it is a momentarily snapshot, and we see a peak in some curve, it doesn't necessarily mean anything. You have to gather data from a longer period of time, if we want to analyse it more.”*

The companies described many things, which can be created based on the internalized knowledge. The knowledge facilitates management of the company, development of new features, new products, and new business models. The internalized knowledge was also believed to be useful in terms of competition in application stores:

Createtrips (Kukkonen): *“We can try to create the finest algorithm on recommendation of places to people.”*

5.2.4 Comparison to literature

The contributing constructs and processes for organizational learning have been identified as knowledge acquisition, distribution and interpretation of information, and organizational memory (Huber 1991). The results indicated that all the constructs and processes were present in the studied organizations. It was discovered that BI tools facilitated knowledge acquisition to the organization about end user's behaviour and needs. Acquired information was distributed and interpreted within the organization. BI tools were considered also as an impartial source, which may be utilized for verification of decisions and learning within the organization. Knowledge gained with BI tools was typically automatically saved into the 3rd party tool provider

infrastructure or to the company's own data infrastructure. The barriers in the usage of BI tools for organizational learning were the large amount of data available, different interests of diverse personnel, lack of real-time nature of observed statistics. The role of analytics in organizational learning and possible barriers in their usage in the context of application stores may be considered as new information in comparison literature (Huber 1991).

Organizational learning has been divided into different types (Argyris & Schön 1996) (Yeo 2002). Most of the companies learned based on trial and error, where analytics are utilized for observing the outcome of actions/behaviour. The type of learning refers to lower level/single loop learning, where association between behaviour and outcomes is developed within a given set of rules. There was no direct evidence of changing overall rules and norms (governing variables) in the organization, which is characteristic of higher-level/double loop learning (Argyris & Schön 1996). However, some learning happened on higher level of the organization (CaddieON: efficient marketing mechanisms, Fingersoft: special offers on special days), which is typical for double loop learning. Triple loop learning refers to integration of organizational goals with the learning process (Yeo 2002). Jongla uses analytics for daily learning, and discusses the dashboards on a weekly basis on a team level. This suggests that the company may be able to achieve triple loop learning, but this would require more research within the organization. Also, all important decisions in Createtrips are based on learning from analytics, which suggests that organizational goals have been integrated with the learning process.

A spiral mode for knowledge transformation has been defined (Nonaka 1996). The results indicate that the companies are able to utilize analytics for internalization of explicit knowledge, which is acquired from analytics tools. An example of explicit-tacit-explicit knowledge transformation is Fingersoft's development of special offer capability to their application product based on learning of explicit knowledge, which was gained with an experiment performed with analytics tools. Internalization of explicit knowledge from analytics may take time, because reflection of displayed dashboards may be needed, and a lot of data may need to be gathered.

In earlier literature local market knowledge has been costly to acquire for organizational learning (Lord & Ranft 2000). CaddieON has had challenges in collecting knowledge about potential distributors for internationalization. Fingersoft is interested in finding knowledge of potential B2B partners for internationalization in markets, where they cannot operate independently. Thus, market knowledge on B2B partners may also be costly to acquire in the chosen research context. However, analytics may facilitate acquisition of local B2C market knowledge to some extent, for example by analysing the behaviour of end users.

Earlier literature has seen organizational learning to consist of social, technological, and market learning, which should have an impact on the performance of the company (Hsu & Pereira 2008). The interviews show that the different categories of learning may be facilitated by BI tools. The effect of learning on performance of the companies cannot be evaluated in this study. However, many of the companies emphasized the central role of analytics in learning due to the competition in application stores. Thus, analytics and learning are seen as essential source for competitiveness.

5.3 Analysis

Figure 6 describes results of the study, which have been created inductively based on the interviews. The results have been mapped to the theoretical frameworks of internationalization and organizational learning. First, the role of analytics in the Uppsala-model (Johanson & Vahlne 2009) has been illustrated. Analytics may facilitate getting of different knowledge opportunities for an internationalizing company. Data itself may also be considered as a source of opportunities. Analytics may also be utilized for development of end user (B2C) and B2B relationships for internationalization. Analytics were considered especially useful for learning based on end user relationships (B2C). They may also be utilized for creation of trust and credibility in B2B relationships. In overall, analytics facilitate development of network position for a company, which can be seen as a driving force in internationalization process (Johanson & Vahlne 2009). Also, network position may also be considered as a position in application stores (i.e. ranking).

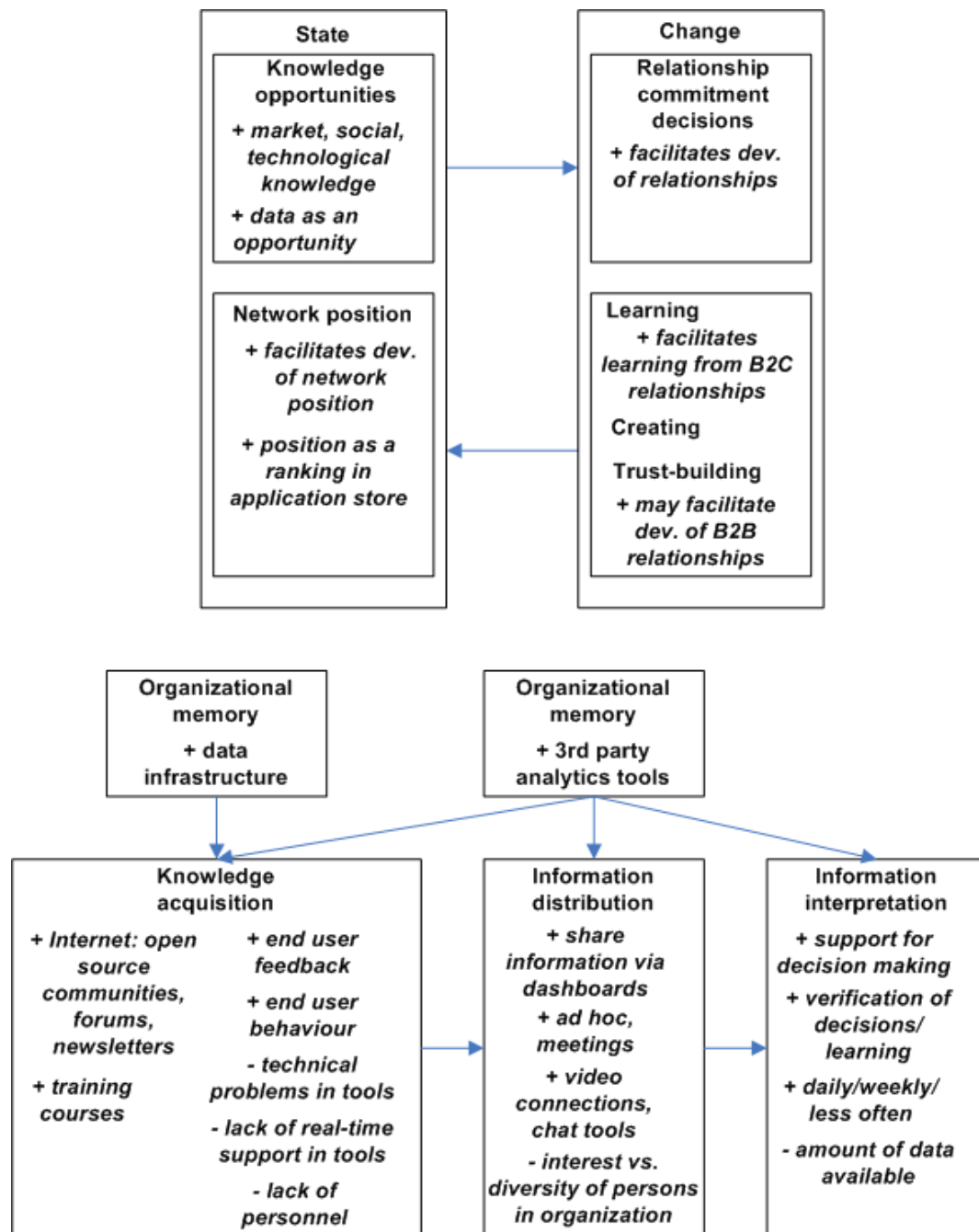


Figure 6. Results illustrated in theoretical frameworks of internationalization (adapted based on Johanson & Vahlne 2009) and organizational learning (adapted based on Huber 1991). +sign illustrates a facilitative effect, -sign describes reported barriers.

Second, the role of analytics in the organizational learning processes (Huber 1991) is analysed. 3rd party analytics tools act as an organizational memory storing historical analytics data. Also, the company may store data into a separate infrastructure such as company's database or to the cloud infrastructure, which is managed by the company. Knowledge is mainly acquired for the purpose of getting feedback from end users, and for understanding end user behaviour. Additionally, knowledge is

acquired from the Internet, and from external training courses. Acquired information is shared typically via the dashboards of the analytics tools. Also, information is shared ad hoc, in meetings possibly facilitated by video connections, or via chat tools. Finally, analytics may be interpreted daily, weekly or less often depending on the company. The main purpose in interpretation of analytics is support for the company's decision making process. Also, learning and decisions may be verified based on analytics.

Figure 7 presents the results in the theoretical framework of knowledge transformation (Nonaka 1991), and organizational learning (Argyris & Schön 1996). First, analytics provide explicit knowledge to the company via the dashboards. Explicit knowledge can be transformed into tacit knowledge, after statistically enough data has been collected. Also, reflection may be required in interpretation of the dashboards for internalization of knowledge. Companies may create many new things based on the internalized knowledge. Learning based on analytics may be considered as a continuous learning process.

Second, analytics are utilized for analysing associations between actions and consequences in the organizational learning process. Learning occurs, when matches/mismatches are observed between expectations and consequences. Based on the results of interviews, mismatches were corrected with actions, which could be characterized as single loop learning. Typical actions were related to decision making regarding development of applications.

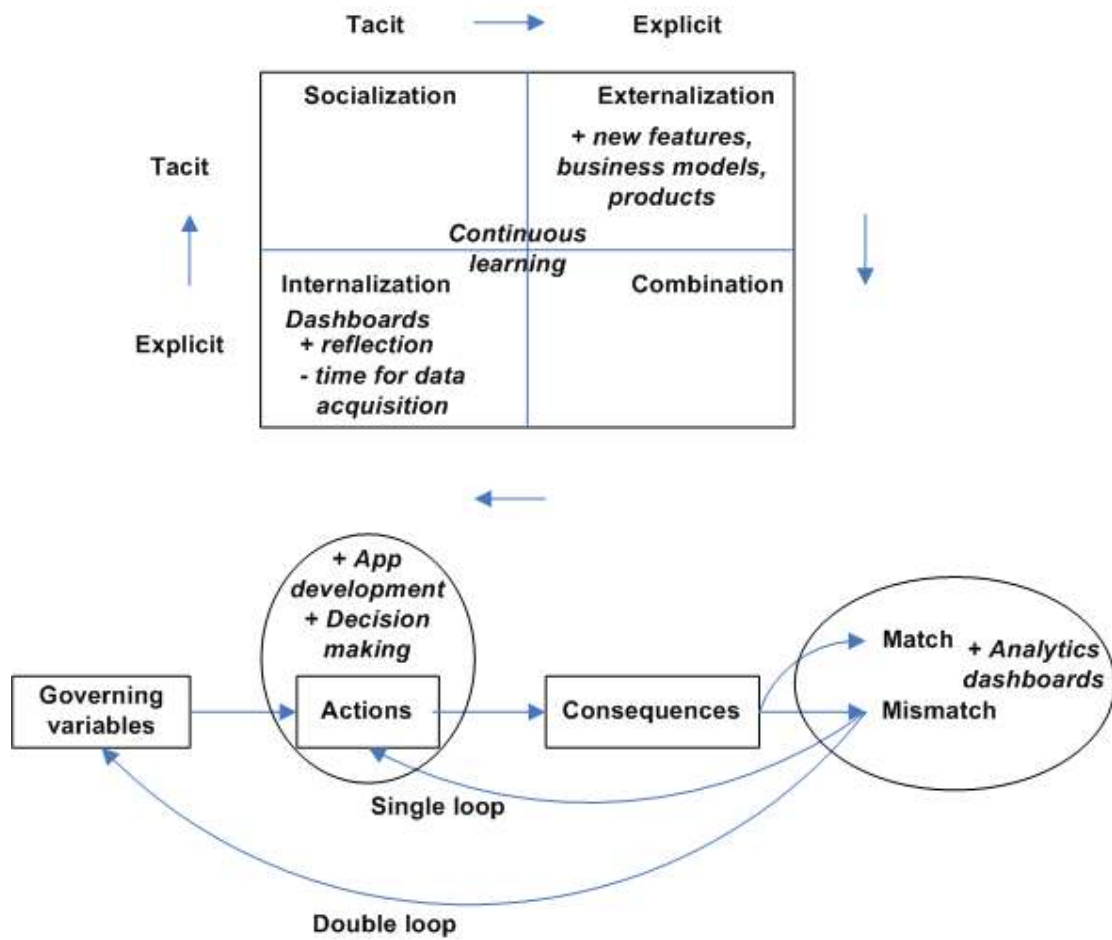


Figure 7. Results illustrated in the theoretical frameworks of knowledge transformation (adapted based on Nonaka 1991) and type of organizational learning (adapted based on Argyris & Schön 1996).

Figure 8 presents a new model, which has been created based on results of the analysis (Figures 6 and 7). Particularly, a unified model is proposed, which illustrates connections between internationalization, organizational learning, and knowledge transformation theories. The acquired explicit knowledge may be internalized into tacit knowledge, or combined into other explicit knowledge (Nonaka 1991). Further, the tacit knowledge may be socialized (into tacit knowledge) or externalized into explicit knowledge, which may be considered as part of information distribution within the organization (Huber 1991). When information is interpreted, it may be matched with expectations, which is part of the organizational learning process (Argyris & Schön 1996). When interpretations are made, the company may get new knowledge opportunities for internationalization (Johanson & Vahlne 2009). This may be followed by actions for internationalization of the company (creating, trust-building, relationship commitment decisions) or re-evaluation of governing variables

in the organization. The actions may improve network position for the company in terms of internationalization.

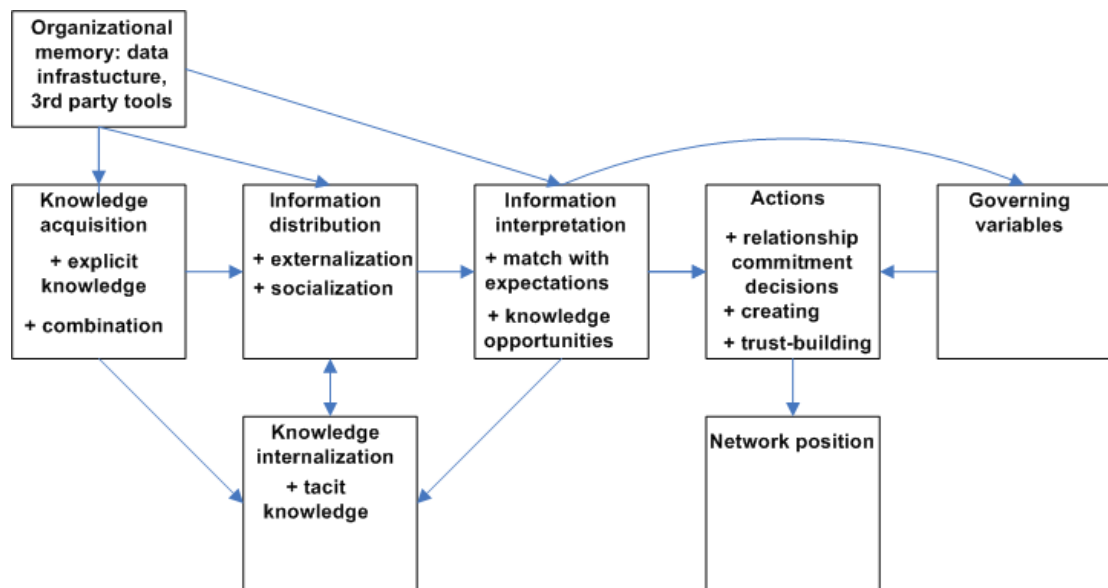


Figure 8. Unified model for internationalization, organizational learning, and knowledge transformation.

6 DISCUSSION

This thesis focused mainly on the role of analytics for internationalization and organizational learning. Particularly, the analysis in Section 5.3 can be considered as the main result. A unified model was proposed (in Figure 8), which illustrated relationships between the theoretical constructs of internationalization, organizational learning, and knowledge transformation. The model may be considered as a starting point for more detailed research on integration of the theoretical concepts. Particularly, validity of the model should be tested in other use cases, where companies utilize BI tools for learning and internationalization.

The case companies utilized some (Google analytics, Localytics, AppAnnie, Flurry) of the reviewed analytics tools (Table I). None of the case companies indicated that the cost of the tools would be a significant factor for the company or would be a barrier in the utilization of analytics. Most of the case companies have integrated analytics tools with a SDK to the published application. In addition, analytics tools requiring no integration with applications are utilized e.g. AppAnnie for analysing monetization aspects in the game industry (Fingersoft). Data ownership was mentioned as a potential downside in the usage of analytics (Fingersoft, section 5.2.1). Thus, it could be expected that data ownership or data sharing issues with 3rd parties may have a role in the selection process of an analytics tool for some companies.

The results of the thesis may be discussed also in terms of other relevant literature. Lean start-up is a philosophy for fastening the development of businesses and products (Ries 2011). The philosophy has become very popular among start-ups. It aims at elimination of wasteful practises, and increasing of value producing practises. It is based on a set of core concepts. A minimum viable product (MVP) is used for testing fundamental business hypothesis, and for facilitating fast learning. Continuous deployment process refers to deployment of all code immediately into production for reduction of cycle times. Build-measure-learn cycle refers to software development based on constant measurement of consumers' feedback and behaviour. The afore-mentioned core concepts of the lean start-up philosophy are also reflected in the results of this thesis. Build-measure-learn cycle could be seen in the

development process of some of the case companies, which utilize 3rd party analytics tools in the development (sections 5.1.1 and 5.2.1). Also, some level of continuous deployment (Holmström, Alahyari & Bosch 2012) may be utilized by the case companies, although the concept wasn't studied in this thesis:

Createtrips (Kukkonen): *“We improve our app with a really rough cycle. We design 2 days, code for 5 days, 2 days testing, publish. We aim at having an update in the store every 2 weeks.”*

7 CONCLUSION

7.1 Theoretical implications

This thesis focused on the role of business intelligence for internationalization and organizational learning. The topic was studied in the context of application markets. The main theoretical framework of the study consisted of business intelligence, internationalization process model (Johanson & Vahlne, 1977 & 2009), and organizational learning theories (Argyris & Schön 1996) (Huber 1991). Related theoretical topics included exporting, and e-commerce.

The methodology was based on qualitative research. Initially, research questions and themes were discovered based on a literature review. Subsequently, qualitative material was gathered by conducting semi-structured interviews with four case companies, which utilize business intelligence tools for facilitating development and publication of applications. The content of interviews was transcribed, classified, and presented within the selected research themes. An analysis was made, and the role of BI tools was presented in relation to the theoretical framework. Also, a new model was proposed, which integrates internationalization and organizational learning theories together.

The primary research question was: *How can business intelligence facilitate organizational learning for internationalization?* In overall, BI facilitates organizational learning by supporting organizational learning process of a firm. Organizational learning may also be a part of the internationalization process. The primary research question was approached by providing answers to two secondary research questions, which focused on internationalization and organizational learning.

The first secondary research question was: *How business intelligence facilitates learning for internationalization?* In overall, business intelligence can facilitate internationalization in several ways. The implication to the Uppsala-model (Johanson & Vahlne, 1977 & 2009) is to understand the significant role of BI tools in the

internationalization process of a firm (Figure 6). The main implications are described in the following:

First, BI tools facilitate gaining of market knowledge for internationalization. The companies gained also social and technological knowledge for learning and internationalization. The different knowledge types have also been discovered as important for internationalization in earlier literature (Zahra, Ireland & Hitt 2000) (Johanson & Vahlne 1977) (Hsu & Pereira 2008). The different purposes/goals of learning with BI tools for internationalization can be considered as novel information. Second, the results show that several opportunities for internationalization may be acquired with BI tools, which is a new viewpoint in the internationalization model (Johanson & Vahlne 2009). For example, BI tools can be used for building credibility in B2B negotiations or for understanding what kind of content is interesting in a geographical region. Data gained with BI tools may also be considered as an opportunity in itself. Third, the companies learned from B2C relationships based on feedback provided by end users, and by utilizing BI tools. This aspect was seen as especially important in the context of the study due to tight competition in application stores. Thus, BI tools may be seen as a tool to improve competitiveness of a firm. BI tools may also facilitate development of B2B relationships in terms of providing credibility to business negotiations. Fourth, an optimal network position was important for the case companies, which is part of the earlier theory (Johanson & Vahlne 2009). Analytics may be utilized in several ways for improving a network position such as continuous learning and improvement of applications, increasing the impact of marketing or analysis of the application markets. Network position can also be understood as a ranking in the application markets, which may be improved with app store optimization.

The second secondary question was: *How business intelligence facilitates organizational learning?* In overall, BI facilitates organizational learning in several ways. Organizational learning processes (Huber 1991), type of organizational learning (Argyris & Schön 1996), and knowledge transformation (Nonaka 1991) were focused on as sub-themes. The implication for organization learning process (Huber 1991) is to understand the role of BI tools and its possible barriers in it (Figure 6). Also, BI tools may facilitate acquisition of local market knowledge,

which has earlier been costly to acquire (Lord & Ranft 2000). Further, all case companies were able to identify an event, where BI tools were utilized for organizational learning. Most of the companies learned based on trial and error, where analytics were utilized for observing the outcome of actions/behaviour. This is typical for single/lower level of organizational learning (Argyris & Schön 1996). Also, some learning occurred in higher level of the organization, which is a characteristic of double loop/higher level learning. Additional and more detailed research within the organization would be required for discovering, if double (Argyris & Schön 1996) or triple loop learning (Yeo 2002) is reached in the companies. Finally, the companies were able to utilize analytics for internalization of explicit knowledge (Nonaka 1991) gained with BI tools. The internalized tacit knowledge may be utilized for creation of many different new things/innovations.

In addition to the main theories under focus in this thesis, the results have also implications to theories on exporting and e-commerce. The companies gathered experiential knowledge with analytics tools for identification and evaluation of exporting markets (Leonidou & Katsikeas 1996). Analytics was also considered as an impartial source indicating effectiveness of learning and decisions made (section 5.2.1, case Jongla). Thus, the knowledge gained with analytics could also be considered as objective. Analytics tools may be utilized for free (to some extent). Thus, analytics facilitate acquisition of exporting knowledge (in the context of application markets), which has been earlier limited, and not cheaply available (Leonidou & Katsikeas 1996). However, the companies also need knowledge for building of B2B relationships with partners in order to facilitate exporting (section 5.1.4). Such knowledge may not be acquired with analytics, and may not be cheaply and easily acquired.

Learning in the exporting context has been categorized into technological, market, and social learning (Yeoh 2004). Many examples of market learning were reported by the case companies (section 5.1.2). Utilization of feedback from end users for improvement of products could be considered as social learning. Fingersoft learned technological issues from a B2B partner (section 5.1.4). Analytics was utilized daily in product development (Jongla and Createtrips), which can also be considered as technological learning. Learning with analytics tools may also be considered as

learning by exporting (Love & Genotakis 2013), since knowledge is transferred to the exporting company via internationally traded goods/services (applications). Knowledge gained with analytics may also be seen as knowledge spillover for improving of competitiveness for the company (Garcia, Avella & Fernandez 2012).

The companies execute transactions as in app purchases with consumers, which has been the primary focus in e-commerce (Pavic et al. 2007: 322). E-business also considers connectivity of the organization to include suppliers, employees, and business partners with CRM, supply chain management, and business intelligence. The case companies have integrated mobile analytics tools (BI) as part of daily business operations, which fits the e-business definition (Pavic et al. 2007: 322). The companies learn extensively with analytics on foreign markets and from end users. Thus, analytics may significantly decrease the effect of liability of foreignness and increase the speed of internationalization (Arenius, Sasi & Gabriellson 2006). Utilization of analytics may be considered as a knowledge building tool, which increases knowledge intensity of companies, which has been studied earlier (Loane 2006) (Jaw & Chen 2006). Jongla is conducting usability testing for end users in a foreign country, in order to understand local experience of consumers. Thus, online internationalization or analytics may not fully substitute for cultural and business learning on foreign markets (Yamin & Sinkovics 2006). A virtuality trap (Yamin & Sinkovics 2006) may have to be recognized, when learning is facilitated by analytics. The companies focused on the utilization of explicit knowledge gained with mobile analytics tools (Figure 2). They monitored organizational performance, developed new offerings, and utilized BI for internal decision making, which are potential benefits of BI reported in earlier literature (Davenport & Dyché 2013). Large social media companies (e.g. Facebook, Twitter, LinkedIn) have utilized analytics for years for the improvement and development of new mobile services (Thusoo et al. 2010) (Sumbaly, Kreps & Shah 2013) (Mishne et al. 2013). However, the large companies are capable of storing the collected data on their own infrastructure, which is not feasible for small enterprises, which may have to utilize 3rd party analytics tools.

7.2 Managerial implications

The main managerial implications originate from the role of BI tools for learning, and from B2B relationships, when internationalizing via application stores. From the point of view of BI tools, the main managerial implication is the requirement for using mobile analytics/BI tools for learning. This implication is based on the very tight competition in application stores experienced by the case companies. Learning based on analytics is seen as a tool to improve competitiveness of a firm. Further, even utilization of analytics may not be enough, and other functions may be needed in the development of applications (e.g. usability analysis (Jongla)). The author was surprised by how extensively some of the case companies were utilizing mobile analytics tools in their operations.

The second implication is that analytics should be seen as an important tool facilitating organizational learning. The manager should identify the type of knowledge and opportunities, which can be enabled by the analytics tools, especially for achieving an optimal position in a network. Also, the manager should identify how the entire organization can learn and make important decisions based on BI tools.

The third implication is that the manager should identify how BI tools can facilitate development of B2C and B2B relationships. Mobile analytics tools provide different kind of knowledge about the end user (B2C). Additionally, the knowledge gained may also be useful for development of business relationships e.g. in the negotiations with B2B partners.

The fourth implication for the manager is to understand capabilities of the analytics tools. The list of 3rd party tools (Table I) can be used as a starting point. Most of the utilized tools are free (Flurry, Google analytics), but also commercial versions of the tools are available. The manager should also identify the potential downsides of the solutions (real time nature of the tool, data ownership issues, data sharing to 3rd parties).

Finally, the manager should recognize the importance of developing successful B2B relationships, and the role of networks in internationalization. Also, possibilities for learning from B2B partners should be identified.

7.3 Limitations of the study

A significant limitation of the study is reliance on one interview per case company. In order to get more detailed information regarding the usage of BI tools, multiple interviews should be organized with different stakeholders of the companies. Additionally, every subtheme could not be studied with all case companies due to time constraints. This constrained analysis of some of the subthemes (opportunities for internationalization, knowledge transformation).

Also, a limited amount of secondary material was available. Application stores and application store analytics services (e.g. Distimo) provided information on published applications by the companies. Companies' own web sites contained information about some of the BI tools, which were reported by the companies. This information was compared (triangulated) with the results of the interviews, and the information was found to be accurate.

7.4 Reliability and validity

Reliability indicates the extent of getting the same results and conclusion, if the research procedure would be executed by another researcher (repeatability). The applied methodology (section 4.2) and semi-structured interview (Appendix) have been described, which may be replicated in other similar studies.

Validity of research indicates the extent to which research provides the correct answer. Validity in case study research can be further divided into construct, internal and external validity (Yin 2009: 40). Construct validity refers to identification of correct operational measures for the concepts under study. The initial constructs for the research were created based on the literature review, based on which research questions, and research themes were selected. Other parts of the constructs were created inductively based on the qualitative interview material. The results of the

study were reviewed by the key informants of the companies, which may have increased validity of the chosen constructs. Also, a chain of evidence was maintained between research questions, research themes, interview data/database, and research report. Multiple sources of evidence were used where applicable, which may also increase construct validity. For example, publication of applications, and utilization of analytics tools as has been publicly reported by the case companies were compared to the results of interviews (triangulation in terms of corpus).

External validity refers to the domain to which the results can be generalized to (Yin 2009: 38). In qualitative research analytical generalization is possible. Thus, the results were generalized in relation to the chosen theoretical frameworks, but not to other similar companies (which would be statistical generalization).

7.5 Considerations for further work

The thesis concentrated mainly on the role of BI tools in the internationalization and organizational processes. The steps/sequence in the internationalization process (Johanson & Vahlne 2009) was not focused on, which could be part of future research. However, there is evidence of a sequential pattern in the internationalization of the case companies. For example, CaddieON doesn't currently have international business on a wide basis, but the company is negotiating with possible B2B partners for distribution in Europe in order to increase the amount of international business. Another example is Createtrips, which initially built a test version of the application, which was released in New Zealand. Based on analytics and feedback from end users, the application was improved. Subsequently, the application was published again (after 6 months) in near East Asia and Philippines. Currently, the application is published in tens of countries globally. Another aspect is barriers in the internationalization process, as some countries (e.g. China) don't allow exporting via global application stores (Salz 2014: 192). In addition, the effect of learning with BI on the speed of internationalization could be studied. Also, it would be interesting to know, if BI can lead faster to higher level of organizational learning, which has earlier happened at the later stage (reorientation) of internationalization (Anderson & Skinner 1999).

The effect of learning on performance of the firm was not focused on in this study. However, the results indicated that most companies highlighted the importance of learning with analytics in terms of competition. This suggests that quality/performance of applications can be improved with analytics, which is believed to further improve network position for companies, and potentially also performance of the company. This would be an interesting topic for future research as earlier studies have discovered the positive effect of learning on performance of the firm (Zahra, Ireland & Hitt 2000) (Jimenez-Jimenez & Sanz-Valle 2011) (Hsu & Pereira 2008). Further, in the interviews top managers of the companies emphasized the importance of learning, which is encouraging, since earlier research has discovered its positive effect on development of skills and competences of personnel, and ultimately performance of the firm (Bolivar-Ramos, Garcia-Morales & Garcia-Sanchez 2012). Additionally, the dimension of organizational unlearning on performance may be studied, which refers to discarding of old routines to make way for new ones (Yang, Chou & Chiu 2014). Finally, the cost of learning could be studied, which has been earlier an important factor affecting performance in internationalization (Ruigrok & Wagner 2003).

Learning theory is one approach to internationalization. Other approaches would be to study the case companies as International New Ventures (INV) (Oviatt & McDougall 2005) or as born globals (Madsen & Servais 1997). INV is a company, which tries to get significant competitive advantage by the use of resources and sale of outputs in multiple countries (Oviatt & McDougall 2005: 31). Ahola (2014) studied Finnish companies (INVs), which have published applications in mobile application stores. The results indicated that firms internationalized by localizing applications to target markets, and utilized networks in their internationalization. This is in contrary to the born global model (Madsen & Servais 1997), in which firms skip the gradual internationalization phases, and target multiple countries from inception. The results of this thesis have similar characteristics. The case companies understand users in specific countries and markets based on mobile analytics, and are able to target specific markets with tailored content (e.g. Fingersoft). The findings also concluded that use of networks is essential in the internationalization process of the case companies, even if application stores enable global reachability to end users.

The case companies utilized social media for creation of marketing impact. Examples of marketing mechanisms include blogging (Createtrips, CaddieON), and Facebook announcements (Fingersoft). Also, in app cross promotion of applications is performed by Fingersoft (Salz 2014: 124-125). In earlier research it has been argued that social media is a hybrid element in the traditional promotion mix, where companies cannot control communications of the consumers (Mangold & Faulds 2009). Instead, managers must be able to learn to shape discussions in the social media channels for consistency with organization's mission and goals. The use of social media in international advertising has not been studied extensively, but some research results exist (Okazaki & Taylor 2013). In the international context, social media may be utilized in terms of networking capability, image/brand transferability, and personal extensibility (Okazaki & Taylor 2013). Social media/viral marketing campaign may need to be designed based on utilitarian vs. hedonic features of the marketed product to improve impact (Schulze, Schöler & Skiera 2014). Also, it has been discovered that similarity between used and advertised application improves effectiveness in cross-promotion of applications (Lee, Lee & Winston 2014). Future research could be performed for understanding if a standardized vs. adapted strategy for marketing could be utilized for building of brand image. Also, the effect of cultural factors on consumer responsiveness, and feasibility of cross-market segmentation require more study. In overall, the impact of marketing in the international context would be an interesting topic for future research.

Mobile application stores are an exceptional business area to study BI, because a plethora of free analytics tools are available for learning about end users/customers, and barriers to exporting are low. Future work could consider, if the findings from the mobile application store context are applicable in other business contexts. For example, e-commerce in retail may already have many tools available for conducting similar BI functions. In overall, it would be interesting to know, if organizational learning with BI tools is becoming mandatory for maintaining competitiveness also in other branches of business (as noted by Davenport (2013))?

7.6 Acknowledgements

The author acknowledges representatives of the case companies for collaboration. This thesis wouldn't exist without their contribution. Also, supervisor of the work (Professor Mainela) is acknowledged for providing constructive feedback during the working process.

APPENDIX

A.1. Semi-structural interview

In the following the structure of interviews is described. The interview comprised of the main research themes, which were presented in Section 4.1.

Internationalization:

1. Internationalization and knowledge:
 - a.) how are you conducting international business?
 - b.) what type of knowledge is most important in terms of internationalization?
 - c.) how could the knowledge for internationalization be categorized?
 - d.) what type of knowledge is most important in terms of learning for internationalization?
 - e.) how do you learn in international operations? Could you explain the learning process?

2. Type of knowledge for internationalization & BI tools:
 - a.) what type of BI tools are you using?
 - b.) what type of data collection and/or data analysis tools are you using?
 - c.) what type of knowledge is gained in general with BI tools?
 - d.) can you categorize the knowledge gained with BI tools?
 - e.) what type of knowledge, which can be acquired with BI tools, is most important for you in general?
 - f.) how can BI tools be used for gaining knowledge for internationalization?
 - g.) what type of knowledge for internationalization is gained with BI tools?
 - h.) what type of knowledge, which can be acquired with BI tools, is most important in terms of learning for internationalization?

3. Opportunities for internationalization:
 - a.) how would you describe an important opportunity in terms of internationalization?

- b.) what has been the most important sources for opportunities in terms of internationalization (in general)?
- c.) how can BI tools be used for gaining opportunities for internationalization?
- d.) how can you categorize opportunities, which can be gained with BI tools?
- e.) what are the most important opportunities, which can be gained with BI tools?
- f.) what are the most important opportunities from learning point of view?
- g.) are there obstacles in gaining opportunities with BI tools? If yes, which are they?

4. Relationships in internationalization:

- a.) what are the most important relationships for you in terms of internationalization?
- b.) how do you learn from such relationships? If you do, what are the most important issues to be learned from relationships?
- c.) have you made commitment to relationships? If yes, could you describe the relationships?
- d.) how can BI tools be used for creating or development of relationships?
- e.) how valuable are BI tools from the point of view of relationship development?
- f.) what features of BI tools are useful for development of relationships? If not, what features should they include?
- g.) are there any obstacles in terms of relationship development with BI tools?

5. Network position:

- a.) how important is establishment of a position in a network (in relation to customers/competitors) for you? Could you explain what position are you aiming at?
- b.) how do you develop a position in a network?
- c.) how can BI tools be applied for establishment of a position in a network?
- d.) how valuable are BI tools for establishment of position in a network?
- e.) how can you use BI tools for learning about establishment of a network position?

- f.) Are there obstacles in the usage of BI tools, when establishing a network position?

Organizational learning:

1. Constructs and processes:
 - a.) How do you acquire knowledge for the organization?
 - b.) How can BI tools facilitate knowledge acquisition for the organization?
 - c.) Are there any obstacles in knowledge acquisition with BI tools?
 - d.) How do you distribute information in the organization?
 - e.) How can BI tools be used for information distribution in the organization?
 - f.) Are there any obstacles for information distribution in the organization?
 - g.) How do you interpret acquired information in the organization?
 - h.) How do you interpret information produced with BI tools?
 - i.) Are there any obstacles in interpretation of information produced with BI tools?
 - j.) How do you store information produced with BI tools?
 - k.) Are there any obstacles in terms of information storage, which has been produced with BI tools?

2. Type of organizational learning
 - a) How do you learn as an organization?
 - b) Could you describe one event of organizational learning (preferably one which includes usage of BI tools)?
 - c) What has caused you to learn in this case as an organization?
 - d) What did you learn as an organization?
 - e) What has changed as a result of learning in the organization?
 - f) What has not changed as a result of organizational learning?
 - g) How can BI tools facilitate organizational learning?
 - h) How can BI tools facilitate organizational learning for internationalization?
 - i) Are there any obstacles in the usage of BI tools for organizational learning?

3. Explicit to tacit knowledge transformation:
 - a.) how do you internalize information and knowledge, which is gained with BI tools?
 - b.) How long does it take to internalize the knowledge, which is gained from BI tools?
 - c.) Are there any obstacles in knowledge internalization, which is gained from BI tools?
 - d.) what can be created based on the internalized knowledge? How is it created?

REFERENCES

- Ahola N. (2014) International New Ventures' Use of Networks to Target Globally Released Mobile Applications. Master's Thesis, Department Of International Business and Management, University of Oulu.
- Alrawi K. (2007) The internet and international marketing. *Competitiveness Review: An International Business Journal*, 17(4): 222-233.
- Amatriain X. (2013) Big & Personal: data and models behind Netflix recommendations. The 2nd International Workshop on Big Data, Streams and Heterogeneous Source Mining: Algorithms, Systems, Programming Models and Applications, August 11-14, 2013, Chicago, Illinois, USA.
- Anderson V. & Skinner D. (1999) Organizational learning in practise: how do small businesses learn to operate internationally? *Human Resource Development International*, 2(3): 235-258.
- Argyris C. (1999) *On organizational learning*. Blackwell Publishers.
- Argyris C. & Schön D. A. (1996) *Organizational learning II*. Addison-Wesley Publishing Company.
- Arenius P., Sasi V., Gabrielsson M. (2006) Rapid internationalisation enabled by the internet: The case of a knowledge intensive company. *Journal of International Entrepreneurship*, 3(4): 279-290.
- Autio E., Sapienza H. J. & Almeida J. G. (2000) Effects of age at entry, knowledge intensity, and imitability on international growth. *Academy of Management Journal* 43(5): 909-924.

Bolivar-Ramos M. T., Garcia-Morales V. J. & Garcia-Sanchez E. (2012) Technological distinctive competencies and organizational learning: Effects on organizational innovation to improve firm performance. *Journal of Engineering and Technology Management* 29(3): 331-357.

Bughin J., Chui M., & Manyika J. (2013) Ten IT-enabled business trends for the decade ahead. *McKinsey Quarterly*.

Casillas J. C., Acedo F. J. & Barbero J. L. (2010) Learning, unlearning and internationalisation: Evidence from the pre-export phase. *International Journal of Information Management* 30(2): 162-173.

Chen T., Ullah I., Kaafar M. A. & Boreli R. (2014) Information Leakage through Mobile Analytics Services. *ACM HotMobile 2014*, Santa Barbara, California, USA, February 26-27, 2014.

Chiva R., Ghauri P. & Alegre J. (2013) Organizational Learning, Innovation and Internationalization: A Complex System Model. *British Journal of Management*, 25(4): 687-705.

Chu S., Leung L. C., Hui Y. V. & Cheung W. (2007) Evolution of e-commerce Web sites: A conceptual framework and a longitudinal study. *Information & Management* 44(2): 154-164.

Cohen W. M. & Levinthal D. A. (1990) Absorptive Capacity: A New Perspective on Learning and Innovation. *Administrative Science Quarterly* 35: 128-152.

Davenport T. H., & Dyché J. (2013) Big Data in Big Companies. *International Institute for Analytics*.

Davenport T. H. (2013) Analytics 3.0. *Harvard Business Review*, 57(12): 65-72.

Fiol C. M. & Lyles M. A. (1985) Organizational Learning. *The Academy of Management Review* 10(4): 803-813.

Forsgren M. (2002) The concept of learning in the Uppsala internationalization process model: a critical review. *International Business Review* 11(3): 257-277.

Forsgren M. & Hagström P. (2007) Ignorant and impatient internationalization? The Uppsala model and internationalization patterns for Internet-related firms. *Critical perspectives on international business*, 3(4): 291-305.

Ganti R. K., Ye F. & Lei H. (2011) Mobile crowdsensing: current state and future challenges. *IEEE Communications Magazine*, 49(11): 32-39.

Garcia F., Avella L. & Fernandez E. (2012) Learning from exporting: The moderating effect of technological capabilities. *International Business Review* 21(6): 1099-1111.

Grant R. M. (1996) Prospering in Dynamically-Competitive Environments: Organizational Capability as Knowledge Integration. *Organization Science* 7(4): 375-387.

Herschel R. T. & Jones N. E. (2005) Knowledge management and business intelligence: the importance of integration. *Journal of Knowledge Management* 9(4): 45-55.

Hirsjärvi S. & Hurme H. (2001) Tutkimushaastattelu Teemahaastattelun teoria ja käytäntö. Helsinki University Press.

Holmström Olsson H., Alahyari H. & Bosch J. (2012) Climbing the “Stairway to Heaven” A multiple-case study exploring barriers in the transition from agile development towards continuous deployment of software. 38th Euromicro Conference on Software Engineering and Advanced Applications. September 5-8, 2013, Cesme, Izmir, Turkey.

Holzer A. & Ondrus J. (2011) Mobile application market: A developer’s perspective. *Telematics and Informatics* 28: 22-31.

Hsu C. & Pereira A. (2008) Internationalization and performance: The moderating effects of organizational learning. *The International Journal of Management Science* 36(2): 188-205.

Huber G. P. (1991) *Organizational Learning: The Contributing Processes and the Literatures*. *Organization Science* 2(1): 88-115.

Hung R.Y.Y. et al. (2010) Dynamic capability: Impact of process alignment and organizational learning on performance. *Journal of World Business* 45: 285-294.

Isik Ö., Jones M. C. & Sidorova A. (2013) Business intelligence success: The roles of BI capabilities and decision environments. *Information & Management* 50(1): 13-23.

Jaw Y. & Chen C. (2006) The influence of the Internet in the internationalization of SMEs in Taiwan. *Human Systems Management* 25(3): 167-183.

Jimenez-Jimenez D. & Sanz-Valle R. (2011) Innovation, organizational learning, and performance. *Journal of Business Research* 64(4): 408-417.

Johanson J. & Vahlne J. (1977) The internationalization process of the firm – a model of knowledge development and increasing foreign market commitments. *Journal of International Business Studies*, 8(1): 23-32.

Johanson J. & Vahlne J. (2003) Business Relationship Learning and Commitment in the Internationalization Process. *Journal of International Entrepreneurship* 1(1): 83-101.

Johanson J. & Vahlne J. (2009) The Uppsala internationalization process model revisited: From liability of foreignness to liability of outsidership. *Journal of International Business Studies* 40: 1411-1431.

Kim D. (2003) The internationalization of US Internet portals: does it fit the process model of internationalization? *Marketing Intelligence & Planning* 21(1): 23-36.

Kuusela R., Sirkka A. & Kuusela-Korva T. (2013) Organizational learning in cloud and lean transformation. *Communications of Cloud Software* 2(1).

Lee G.M., Lee J. & Whinston A.B. (2014) Matching Mobile Applications for Cross Promotion. Workshop on E-business, December 13, 2014, Auckland, New Zealand.

Leonidou L. C. (2004) An analysis of the barriers hindering small business export development. *Journal of Small Business Management* 42(3): 279-302.

Leonidou L.C. & Katsikeas C.S. (1996) The Export Development Process: An Integrative Review of Empirical Models. *Journal of International Business Studies* 27(3): 517-551.

Leonidou L. C., Katsikeas C. S. & Coudounaris D. N. (2010) Five decades of business research into exporting: A bibliographic analysis. *Journal of International Management* 16(1): 78-91.

Lim E., Chen H. & Chen G. (2013) Business Intelligence and Analytics: Research Directions. *ACM Transactions on Management Information Systems* 3(4).

Loane S. (2005) The role of the internet in the internationalization of small and medium sized companies. *Journal of International Entrepreneurship* 3(4): 263-277.

Lord M. D. & Ranft A. L. (2000) Organizational Learning about New International Markets: Exploring the Internal Transfer of Local Market Knowledge. *Journal of International Business Studies* 31(4): 573-589.

Love J. H. & Ganotakis P. (2013) Learning by exporting: Lessons from high-technology SMEs. *International Business Review* 22(1): 1-17.

Lovell R. B. (1980) *Adult learning*. John Wiley & Sons, USA.

Madsen T.K. & Servais P. (1997) The internationalization of Born Globals: an Evolutionary Process? *International Business Review* 6(6): 561-583.

Mangold W. G. & Faulds D. J. (2009) Social media: The new hybrid element of the promotion mix. *Business Horizons* 52: 357-365.

Mayer J. R. & Mitchell J. C. (2012) Third-Party Web Tracking: Policy and Technology. *IEEE Symposium on Security and Privacy*, May 20-23, 2013, San Francisco, California, USA.

Mezirov J. (1991) *Transformative Dimensions of Adult Learning*. Josset-Bass Publishers, San Francisco.

Mishne G. et al. (2013) Fast Data in the Era of Big Data: Twitter's Real-Time Related query suggestion architecture. *ACM SIGMOD International Conference on Management of Data*, June 22-27, 2013, New York, USA.

Nonaka I. (1991) The Knowledge-Creating Company. *Harvard Business Review* 69(6): 96-104.

Okazaki S. & Taylor C. R. (2013) Social media and international advertising: theoretical challenges and future directions. *International Marketing Review* 30(1): 56-71.

Oviatt B.M., McDougall P.P. (2005) Towards a Theory of International New Ventures, *Journal of International Business Studies* 36(1): 29-41.

Palomino M. A., Taylor T. & Owen R. (2013) Evaluating Business Intelligence Gathering Techniques for Horizon Scanning Applications, *Mexican International Conference on Artificial Intelligence*, November 24-30, 2013, Mexico City, Mexico.

Pavic S., Koh S.C.L., Simpson M. & Padmore J. (2007) Could e-business create a competitive advantage in UK SMEs? Benchmarking: An International Journal, 14(3): 320-351.

Ries E. (2011) *The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses*. Crown Publishing.

Ruigrok W. & Wagner H. (2003) Internationalization and Performance: An Organizational Learning Perspective. *Management International Review* 43(1): 63-83.

Salonen J., Huhtamäki J. & Nykänen O. (2013) Challenges in Heterogeneous Web Data Analytics – Case Finnish Growth Companies in Social Media. AcademicMindTrek, October 01-04, 2013, Tampere, Finland.

Salz P. (2014) *AppEconomics The Insider's Guide to a Billion Dollar App Business*. InMobi.

Sapienza H. J., De Clercq D. & Sandberg W. R. (2005) Antecedents of international and domestic learning effort. *Journal of Business Venturing* 20(4): 437-457.

Schläfke M., Silvi R., & Möller K. (2013) A framework for business analytics in performance management. *International Journal of Productivity and Performance Management*, 62(1): 110-122.

Schubert P., Williams S.P., and Woelfle R. (2011) Sustainable competitive advantage in E-Commerce and the Role of the Enterprise System. *International Journal of Enterprise Information Systems*, 7(2): 1-17.

Schulze C., Schöler L. & Skiera B. (2014) Not All Fun and Games: Viral Marketing for Utilitarian Products. *Journal of Marketing*, 78(1): 1-19.

Seah M., Hsieh M. H. & Weng P. (2010) A case analysis of Savecom: The role of indigenous leadership in implementing a business intelligence system. *International Journal of Information Management*, 30(4): 368-373.

Sumbaly R., Kreps J., Shah S. (2013) The “Big Data” Ecosystem at LinkedIn. ACM SIGMOD International Conference on Management of data, June 22-27, 2013, New York, USA.

Thusoo A. et al. (2010) Data Warehousing and Analytics Infrastructure at Facebook. ACM SIGMOD International Conference on Management of data, June 06-11, 2010, Indianapolis, Indiana, USA.

Watson H. J. et al. (2006) Real-time Business Intelligence: Best Practises at Continental Airlines. *Information Systems Management* 23(1): 7-18.

Wiklund J. & Shepherd D. (2003) Knowledge-based resources, entrepreneurial orientation, and the performance of small and medium-sized businesses. *Strategic Management Journal* 24(13): 1307-1314.

Wu J., Zhong W. & Mei S. (2011) Application capability of e-business, e-business success, and organizational performance: Empirical evidence from China. *Technological Forecasting & Social Change* 78(8): 1412-1425.

Yamin M. & Sinkovics R. R. (2006) Online internationalization, psychic distance reduction and the virtuality trap. *International Business Review* 15(4): 339-360.

Yang K., Chou C. & Chiu Y. (2014) How unlearning affects radical innovation: The dynamics of social capital and slack resources. *Technological Forecasting & Social Change* 87: 152-163.

Yeo R. (2002) From individual to team learning: practical perspectives on the learning organization. *Team Performance Management: An International Journal* 8(8): 157-170.

Yeoh P. (2004) International learning: antecedents and performance implications among newly internationalizing companies in an exporting context. *International Marketing Review*, 21(4/5): 511-535.

Yin R. (2009) *Case study research: design and methods*. 4th Ed. SAGE Publications, USA.

Zahra S. A., Ireland R. D. & Hitt M. A. (2000) International expansion by new venture firms: international diversity, mode of market entry, technological learning, and performance. *Academy of Management Journal* 43(5): 925-950.

Zaslavsky A., Jayaraman P. P. & Krishnaswamy S. (2013) ShareLikesCrowd: Mobile Analytics for Participatory Sensing and Crowd-sourcing Applications. 29th International Conference on Data Engineering Workshops, April 08-12, 2013, Brisbane, Australia.

Zheng X., Zhu S., & Lin Z. (2013) Capturing the essence of word-of-mouth for social commerce: Assessing the quality of online e-commerce reviews by a semi-supervised approach. *Decision Support Systems* 56: 211-222.