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A concept for an international knowledge base in Laurea UAS

Kovac, Peter

2012 Laurea Leppävaara

Laurea University of Applied Sciences
Laurea Leppävaara

A concept for an international knowledge base in Laurea UAS

Peter Kovac
Degree Programme in Business Management
Bachelor's Thesis
September, 2012

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Year	2012	Pages	52
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This paper was prepared as a part of the bachelor thesis in the Business Management programme at Laurea University of Applied Sciences (Laurea UAS). The main objective of the thesis was to present and analyse a set of requirements which are used in the development process of a knowledge base. Information related to international issues was used as a determining factor of the knowledge base content. The project emphasizes the definition of the knowledge base and its requirements in terms of users and their needs, knowledge base sources and content, and the transformation of data into the database information and knowledge.

The knowledge base requirements were examined with specific regard to the educational environment at Laurea UAS. Therefore, the initial chapters of this thesis offer descriptions of the environment of Laurea UAS, international projects, students and collaboration between the business environment and Laurea as an educational institution.

The theoretical section of the thesis describes the principles of the knowledge-building process in an organization, including the database planning process, system, application and design, and implementation. In addition, an example of a potential software application is presented.

Finally, supported by the theoretical framework, a project concept related to knowledge base creation is presented. The project concept describes a practical example of the knowledge base building process and reveals the potential benefits and challenges for developers throughout the process. The analysis revealed that the concept presented can be potentially useful for students at Laurea; however, the involvement of Laurea's personnel requires further examination.

Key words: database, knowledge, Laurea environment, database building, design, information

Table of Contents

1	Introduction	7
1.1	Thesis objective and research questions.....	8
1.2	Scope of the study	9
1.3	Structure of the thesis	10
2	Project environment	11
2.1	Laurea University of Applied Sciences.....	11
2.1.1	Laurea SID Leppävaara	11
2.1.2	International SID laboratory	12
2.2	International students.....	12
2.3	International projects in Laurea.....	13
2.4	Collaboration between business and education	15
3	Definition of terms.....	15
3.1	Data, information, knowledge	16
3.2	Tacit and explicit knowledge	17
3.3	International knowledge base.....	18
3.4	Knowledge management and knowledge organization	19
3.5	Application of the term within thesis project	20
4	Knowledge base building process in organization	21
4.1	Database planning process	21
4.2	System definition, requirements and analysis	22
4.3	Database application and design	22
4.4	Implementation.....	23
4.5	Testing and operational maintenance	23
4.6	Microsoft SharePoint.....	23
5	The project.....	25
5.1	The purpose behind the knowledge base creation	26
5.2	Project aims and objectives.....	28
5.3	Content of the knowledge base	28
5.4	Users of the knowledge base.....	31
5.4.1	Laurea personnel	31
5.4.2	SID labs and international projects	31
5.4.3	Students.....	32
5.4.4	Business partners	32
5.5	Sources of the knowledge base content	33
6	Practical implementation.....	34
6.1	Project stakeholders and benefits	34
6.2	Database design and implementation	36

6.3	Project organization	38
6.4	Challenges in the project	39
6.4.1	Project consistency	39
6.4.2	Updating conformity	40
6.4.3	Project integration in Laurea's environment.....	40
7	Conclusions.....	41
7.1	Project impact and applications.....	42
7.2	Development proposals	43
	References	44
	Figures	47
	Tables	48
	Appendices	49

Abbreviations

CIMO	Centre for international mobility
DB	Database
FUAS	Federation of Universities of Applied Sciences
HAMK	Hämeenlinna University of Applied Sciences
HEI	Higher education institutions
LAMK	Lahti University of Applied Sciences
OKM	Finnish Ministry of Education and Culture (Opetus- ja kulttuuriministeriö)
SMEs	Small and medium enterprises
IPP	International Partner Programme
KB	Knowledge base
KM	Knowledge management

1 Introduction

Internationalisation of business operations in a company is inevitable for many companies in existing increasingly global environment. Not only for national corporations, who have to maintain their international activities and interact with foreign partners, authorities and customers, but similarly for small and medium sized companies internationalisation has become vital for assuring their sustainability and growth. And it is exactly small and medium enterprises (SMEs) who seek assistance in expanding of their operations abroad. There are numerous commercial support organizations with plenty of experience which poses valuable knowledge about international markets. However, services of these support organizations are often too costly and not suitable in application for smaller companies.

Higher education institutions in Finland and especially universities of applied sciences are increasing their cooperation with business environment through research and development work, projects and partnerships. Business study programmes have an excellent potential in terms of interaction between educational institution and real business environment. With nearly 8 000 students (Laurea UAS 2011, 6), Laurea University of Applied Sciences (Laurea) belongs to larger polytechnics in Finland by both - number of students and personnel.

Involvement of business actors in higher education is not a new idea. It has been discussed, developed and promoted on many universities and higher education institutions all around the world. Finland is not an exception. There has been long experience of involvement of companies in Laurea and other polytechnics and universities. This fact only validates the importance of developing the business-educational cooperation further.

One of above mentioned issues was discussed by Danford (2003) in his publication "Project-based learning and polytechnic-SME collaboration in internationalization". The research paper describes in detail the techniques of project-based learning techniques in Helsinki Business Polytechnic - somewhat equivalent to Laurea's "Learning by developing" method. In the paper, Danford also notes example of internationalization project for SMEs.

Another example arises from the project Promotion on Food International Trade (Pro-FIT) which promotes internationalisation activities within Finnish and Estonian food industry SMEs (Laurea UAS 2010, 8). The experience from this project offers valuable information which can contribute to topics discussed in this thesis. Although the project is also part of international research and development activities in Laurea - for the purposes of knowledge base building discussed in this thesis - the concept itself is not as important as the tool for sharing information among project stakeholders. The project was using Microsoft SharePoint (MS SharePoint) software as a main communication platform. MS SharePoint represents one of the

potential tools in the process of organizing and sharing information, and offers possible solution for topics raised in this thesis. The platform is described more in detail later in this thesis.

Other recent example of development of employment opportunities is presented in project Valoa which is focusing mostly on international students in degree study programmes in Finland. One of the main aims of the project is to facilitate networking between employers and education institutions. It is coordinated by University of Helsinki and partly implemented by University of Oulu and University of Lapland. Altogether it includes 13 universities and organizations such as municipalities, business partners and government organization (Valoa project 2011).

The proposal of the project is to establish higher education gateways for students and employers to meet their expectations and demands. This platform will promote employment and focus in those areas of human resources from the lines of students which companies really need and which are fundamental in company's internationalisation. Another aspect of project's focus is cultural competence (Valoa project 2011).

1.1 Thesis objective and research questions

The number of international students attending Laurea is growing each year - the students' knowledge about their home country environment can be an important asset which can be used in the process of internationalisation of Finnish SMEs. What are the available solutions for organizing information about students' potential and their skills; how to address companies and match their demands? The potential of a knowledge base concept in addressing these issues is discussed in this thesis.

Currently, there are several projects being developed in Laurea related to internationalisation issues and with the involvement of international students. The projects are currently somewhat isolated without evident interconnection. What techniques can be used to utilize the outcome from international projects in Laurea? What practices can be used in order to promote collaboration between those projects? This paper is discussing the advantages of utilization internationally related projects in Laurea. An example knowledge base concept is used to describe the potentials of information and knowledge sharing in a single unified platform.

Many of the courses in Laurea include international aspect in their curriculum. Lecture materials and presentations contain valuable information and should be available for sharing within Laurea's personnel and students. Is there a solution how to share this information and

make it available not only for particular course participants but for Laurea as a whole? Can the knowledge base concept example presented in this thesis fulfil these needs?

This thesis is trying to provide answers to the questions raised above. The main objective is to define and describe the concept of requirements needed for creation of such database.

Discussed issues which are addressed in this thesis can be divided into following aims:

- **Users' needs (why?)** - What are the needs and justification for the knowledge base creation; what are the needs and purposes behind the concept of knowledge base creation?
- **Users (for whom?)** - Who can benefit from the knowledge base; who will be the users of the knowledge base?
- **Knowledge base content (what?)** - What data, information and knowledge can be included in the knowledge base?
- **Transformation - (how?)** - What tasks and processes are included in successful knowledge base building and how to transform the data and information from the sources to the content in the knowledge base?
- **Sources (where from?)** - What are the sources of information and where to find inputs for the knowledge base content?

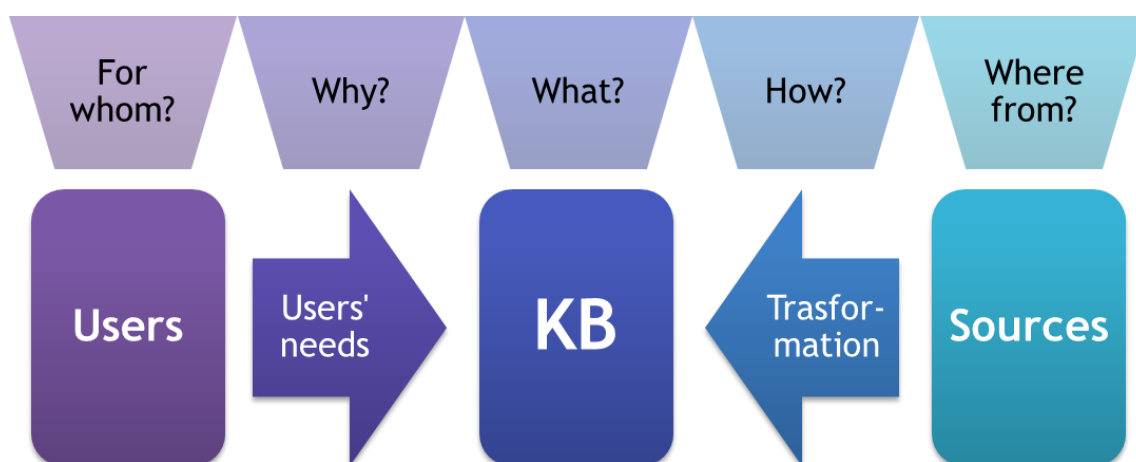


Figure 1: Thesis main research questions

1.2 Scope of the study

The thesis' result is aiming to address the questions raised in the previous section. The final outcome provides a concept describing requirements needed for development of knowledge base of international information in Laurea University of Applied Sciences. Thesis outcomes of this work will include following:

- The purpose of the knowledge base.
- The needs which the knowledge base will address.
- The users of the knowledge base.
- The content of the knowledge base.
- The sources of data and information for the knowledge base.
- The transfer process from sources to knowledge base content - methods, techniques and procedures of the knowledge base content building.

1.3 Structure of the thesis

The structure of this study can be divided into four categories, as seen in Figure 2 below: Introduction and project environment; Definitions of terms and knowledge building process in an organization; Knowledge base project in Laurea UAS and its practical implementation; and Conclusions.

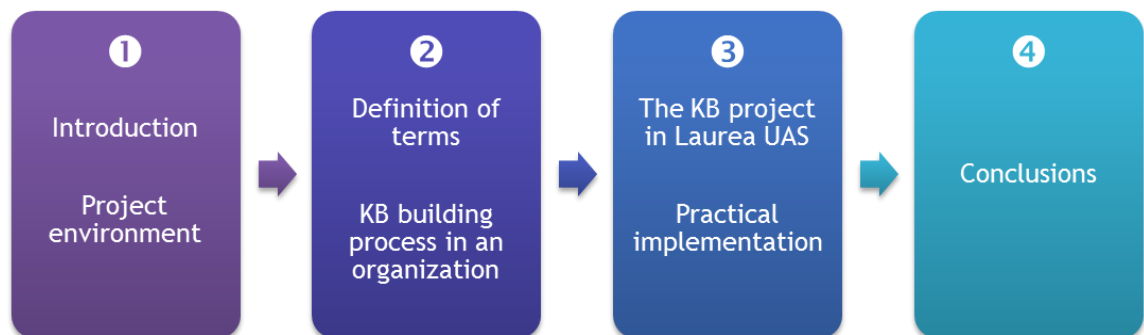


Figure 2: The structure of the thesis

In the first part, the main focus is aimed at introduction of the main topic areas discussed throughout the whole thesis and description of Laurea UAS environment and relevant projects. Second part of this study explains basic terminology and definitions related to knowledge organization and database systems. The practical part of this study is described in the third part and includes concrete concepts for organization of information in Laurea UAS related to foreign markets, internationalisation and enhancing employability of foreign students. Finally, in the last part the conclusions of the concept are discussed together with recommendations and proposals for future development.

2 Project environment

This knowledge base concept related to international information is developed with respect to educational environment of Laurea, the personnel of Laurea including lecturers and project workers, Finnish and international students and also cooperating organizations - such as partner educational institutions and business partners.

For clear understanding of the project background it is essential to introduce the surrounding environment of the project and subjects which are directly connected and in interaction with the project. Following sub-chapters are dedicated to explanation of the project environment in more detail.

2.1 Laurea University of Applied Sciences

Laurea University of Applied Sciences is one of 27 polytechnics currently operating in Finland, with its 7 local units situated in Greater Helsinki Metropolitan Area: Hyvinkää, Kerava, Leppävaara, Lohja, Otaniemi, Porvoo and Tikkurila. It is also a member of Federation of Universities of Applied Sciences (FUAS) in cooperation with Hämeenlinna University of Applied Sciences (HAMK) and Lahti University of Applied Sciences (LAMK). FUAS accommodates about 20 000 students representing 15 per cent of Finland's polytechnics students (Laurea 2011, 2, 7; Finnish Ministry of Education and Culture).

As a higher education institution, Laurea University of Applied Sciences has been actively participating in promoting research, regional development and internationalisation. One of the core issues in Laurea's regional development strategy is "supporting the metropolitan's area international competitiveness, competence transfer, promoting establishment" (Laurea UAS 2010b, 11).

2.1.1 Laurea SID Leppävaara

Laurea's Service, Innovation & Design laboratories (SID labs) represent a combination of research, education and development into single interconnected environment. SID labs are located in Laurea's Leppävaara unit and currently operate in 7 separate departments - Bar Laurea, Business, RED, International, Networks, Security and Neon - with activity focus on several areas varying from business, internationalisation and networking to information technology and security (Ponstijn 2009, 8).

2.1.2 International SID laboratory

SID lab International is one of Laurea's collaborating research and development laboratories focusing on innovation, internationalisation and development of Greater Metropolitan Area. The lab accommodates and develops projects that address internationalisation in multidisciplinary areas of specialisation, and enhances the implementation of the project results to the regions in Finland and abroad. The laboratory is continuously developing with aim to become the gateway for international related research and development activities, knowledge exchange and networks. Furthermore, SID lab International is interconnected with extensive network of local and international partners (universities, organisations and companies) for professional cooperation and development in various areas of expertise with one unifying factor - namely internationalisation. (Laurea 2012)

The core idea behind establishment of Laurea's SID lab International is collaboration with business sector through the project work of students. Currently, the laboratory is involved in several international projects with various partners from different fields: polytechnics and universities, business partners, public and private organizations. The personnel of SID labs includes lecturers, development experts, project workers as well as Finnish and international students and interns. (Laurea 2010, 6)

2.2 International students

According to Centre for international mobility (CIMO) under governance of Finnish Ministry of Education and Culture (OKM), the number of international degree students in Finnish higher education institutions (HEI) has been growing steadily in the past decade. In 2010, the number of international students was higher in polytechnics than in universities for the first time; with students coming in most cases from China and Russia. The detailed statistics of foreign students studying in Finnish HEI is shown in Figure 3 on the next page (Garam & Korkala 2011, 35).

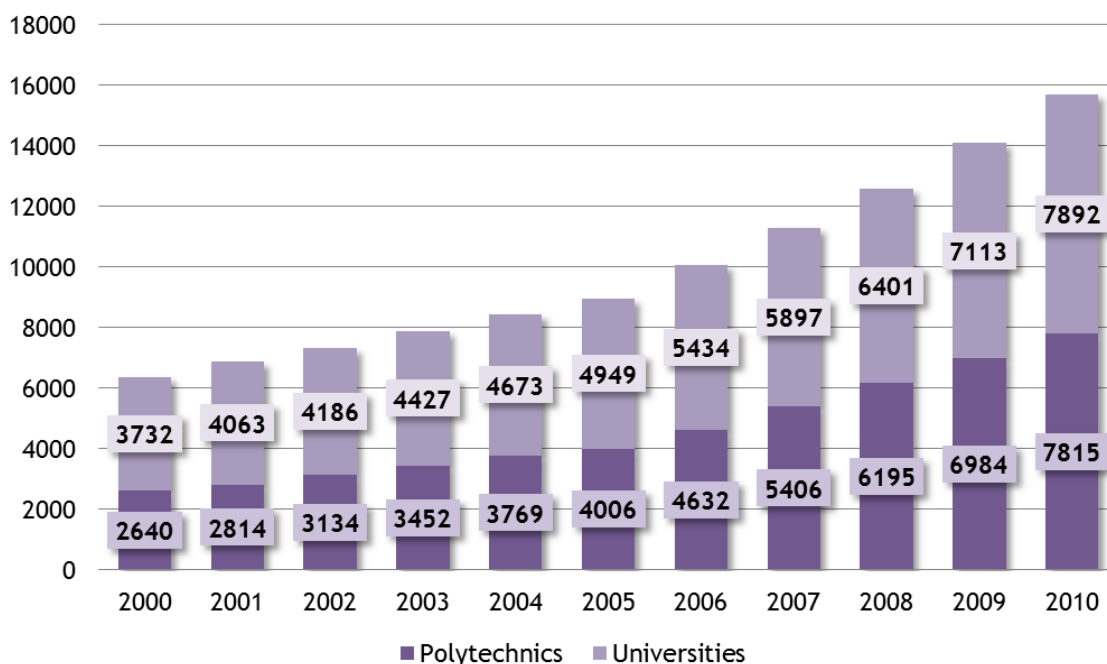


Figure 3: International degree students in Finnish HEI

Finding an internship or employment opportunities for international students in Finland is still challenging mostly due to a language barrier. English as an official language in organizations is very uncommon in Finland, specifically in smaller companies. Although students coming from abroad could provide some viable information about their home countries, cultures and market, Finnish SMEs continually see internationals more as a challenge than an asset. Overcoming this preconception could help Finnish companies to overcome some of the challenges and support their internationalization ambitions. (Tuomola 2009)

2.3 International projects in Laurea

Regional development and promoting internationalisation has been the strategic intent of Laurea in recent years. Laurea has been involved in several projects dealing with matters of internationalisation, collaboration between educational and business environment, and integration of international students in Finnish social and work environment. Some example projects are briefly described below.

(1) Internationalisation of SMEs - The project itself promotes cooperation between students and SMEs through course projects, emphasizing company's internationalisation. The review of Business management degree courses endorsed creation of an extensive service proposal for small and medium enterprises with internationalisation ambitions. Company engagement on Laurea's courses supports initial contacts between students and SMEs, stimulates network

building, and creates possibilities for further cooperation between students and business environment through thesis work and internships.

The project outcome provides analysis of requirements for developing a comprehensive international knowledge base which integrates information about international markets, projects, students, organizations and theory. (Jäättelä, Discussions with project manager. January 2011 - June 2011)

(2) International Partner Programme (IPP) - The main aim of the project is to support companies and other organizations in their internationalisation processes through internship opportunities. The project serves as a matchmaking tool between company's human resource demands and student's distinctive skills and knowledge.

Students' CVs and distinctive skills are gathered and implemented into a database. Based on company's proposal, students are offered internship opportunities accordingly. Student's active performance during the internship provides higher prospects for graduate job offer. (Development of English Degree Programmes project meeting. 27 September 2011)

(3) Innovative Services for Internationals (Expat) - The main objective of the project is to develop a common platform for providing innovative services to increase the interaction among the international professionals and students, locals and private and public service providers.

For the purposes of knowledge base building, Expat project can provide its developed international support organization networks to assist the involvement of students in the international business environment. The project supports the engagement of international organizations in Finland; and provides information about possible business opportunities for Finnish companies abroad. (Development of English Degree Programmes project meeting. 27 September 2011)

(4) Connect - The project is cooperating with Finnish renewable energy SMEs in co-creation of network modes for market entry in developing countries. The main purpose is to support growth and speed up internationalisation of Finnish SMEs to developing countries.

Connect project is aiming to create, develop and pilot test network creation modes for more effective market entry in developing countries. (Aurela, Discussions with project manager. August 2011 - November 2011)

(5) Work life oriented development of English Degree Programmes - One of the aims of the project is to increase the quality of degree programmes, enhance the integration of students, advancement of studies and employability of studies.

The project aim is consistent with the objectives of international knowledge base building. Successful implementation of the knowledge base will positively contribute to development of English degree programmes towards the development of students' skills. Furthermore, the concept of knowledge base can be applied in different study programmes in Laurea and also different partner universities assuring greater number of students involved; increased value of networks; and widened areas of implication. (Development of English Degree Programmes project meeting. 27 September 2011)

2.4 Collaboration between business and education

Nowadays, the global business environment is interconnected to a great extent with countless relationship ties among international business actors. There are several reasons why companies decide to expand beyond national borders: long-term company growth, insufficient market potential in the domestic country, amortization of research and development costs or following international customers, suppliers and competitors (Bürgel 2004, 102). In Finland, with its total population 5.4 million (World Bank, 2010) - the need for internationalization is clearly a reasonable solution in company's development.

The internationalization process of small and medium enterprises has been extensively discussed in numerous publications, research papers and articles. Some of SMEs' most frequent obstacles in their internationalisation include lack of managerial and marketing skills, bureaucracy, limited access to information and knowledge, and lack of financial resources (Johnson & Turner 2010, 276). Some of these barriers can be overcome by collaborating with different partners: public and private support organizations or educational and research institutions.

3 Definition of terms

The impact of knowledge in economic and social behaviour has been increasing rapidly in recent decades. Terms such as information society, knowledge economy, intelligent enterprise and learning organization are frequently discussed in recent business and scholarly publications and journals. Knowledge management or managing knowledge in an organization has become the key enterprise resource (Schreiber 2000, 1-2). The theoretical aspects are well elaborated in numerous knowledge management sources: Awad & Ghaziri (2004), Laudon & Laudon (2009), Nonaka (2005), Schreiber (2000), Tsui (2005) and many more.

3.1 Data, information, knowledge

For purposes of this project thesis it is necessary to define the fundamental terminology and highlight the difference between data, information and knowledge. These terms are frequently discussed by many authors; with most of them consistent in their definitions.

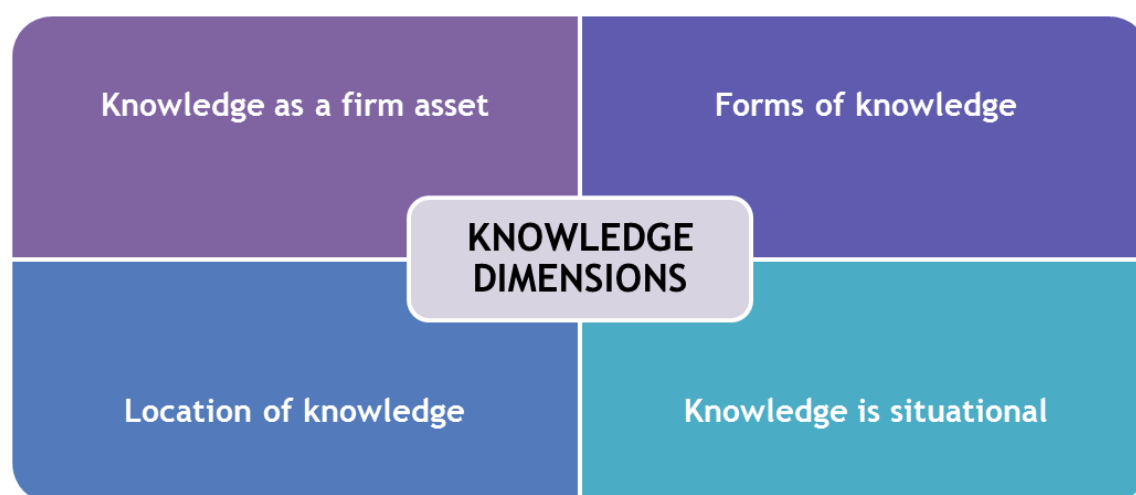


Figure 4: The dimensions of knowledge

Data can be defined as a static fact which alone does not provide the receiver with the meaning and it is not put in the wider concept to provide usefulness for the user. Data is “prerequisite to information” (Awad & Ghaziri 2004, 36). Transformation of data to information is particularly determined by adding a meaning or usefulness of data for its user. This means that same parameters can be viewed as data for one user and as information for another, depending on the meaning equipped with the parameter. The definition of knowledge, however, is more complicated and it is dependent on the wider context (Schreiber 2000, 3-5). Laudon (2010, 442-443) argues that knowledge can be distinct only within specific procedures and patterns. For easier explanation of knowledge definition, the author is using four dimensions of knowledge as shown in Figure 4 (adapted from Laudon 2010, 442) above and described in more detail.

The first dimension emphasizes on persuasion of knowledge as an intangible asset which is affected by cooperation and creation of networks. In other words - more people share knowledge, more valuable it becomes. Second dimension refers to the knowledge in its tacit or explicit form and it is elaborated more closely in the following sub-chapter. The third dimension describes social and individual basis related to knowledge. Finally, Laudon

concludes with the characteristics of knowledge: it is difficult to transfer, integrated in the company's culture and it is functional only in certain situations. (Laudon & Laudon 2010, 443)

3.2 Tacit and explicit knowledge

Tacit knowledge represents the experience in human mind in the form of intuition, values, and beliefs. Due to the intangible nature, tacit knowledge is challenging to share and transfer and it is socially relayed. Explicit knowledge, in contrast, is collected and organized in different ways, mostly in physical and electronic formats, for example books and journals, documents, databases, reports and research papers and so forth. Another differentiating aspect between tacit and explicit knowledge is explained by Awad (2004, 47) through "knowing-how" and "knowing-that". Knowing-how refers to tacit knowledge and can be answered by expert's experience while knowing-that follows theoretical knowledge by using instructions, rules, principles and procedures.

For better understanding of knowledge and the difference between tacit and explicit knowledge, Nonaka (2001, 16-20) is using the "SECI" model of knowledge conversion consisting of socialization, externalization, internalization and combination. The graphical visualization of the model is shown in Figure 5 on the next page (Schreiber et al. 2000, 70).

Socialization and empathizing assumes acquiring tacit knowledge through shared experience. Shared experience in this context means, for example, interacting in the same environment or communication and behaviour towards other people.

Externalization factor can be described as expressing tacit knowledge as explicit knowledge. Transformation process of knowledge from tacit to explicit through sharing with others provides the basis for creation of new knowledge.

Internalization referring to embodying explicit knowledge as tacit knowledge is related to models such as "learning by doing" or learning by developing". The best example of internalization can be explained through training process, simulations and experiment when knowledge acquired by individuals can serve as a basis for new knowledge creation.

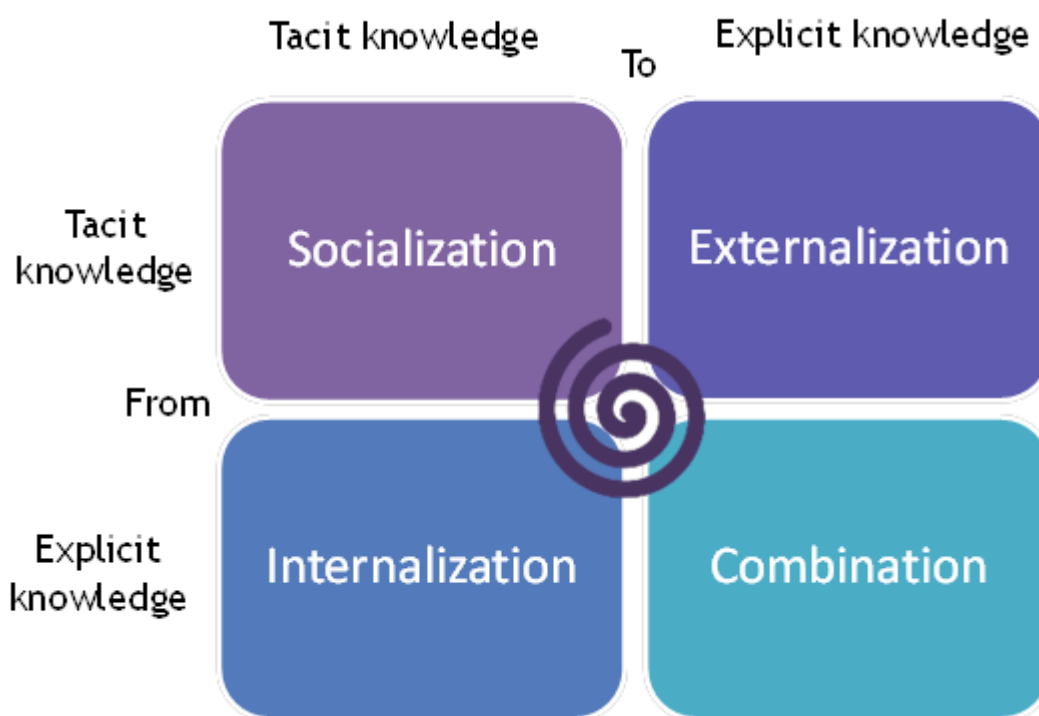


Figure 5: Dynamics of knowledge creation

Finally, combination and converting of explicit knowledge into more sophisticated explicit knowledge is becoming applicable with the development of information technology, computers, communication networks and extensive databases (Nonaka 2001, 16-20).

3.3 International knowledge base

Every organization acquires excessive amount of information from the environment it interacts with. In addition, every organization also generates extensive quantity of information itself. The main question is whether the organization is able to recognize useful information for the purposes of their existence and to organize and benefit from it. This transformation of data and information into knowledge is crucial especially in the field of education, where knowledge is put at the top of the hypothetical list of importance. Educational institutions experience constant flow of information and knowledge shared within school's environment and also towards outside world. It is very important to find solutions how to benefit from these knowledge clusters.

Information technology has experienced unseen advancement in the past decades. It is easier to for organizations to access and share information. This provides a big advantage to those seeking vital information, participants in the learning process and other involved stakeholders. On the other hand it is also "over-flooding" recipients with redundant

information, contributing to higher possibilities of confusion and making searching for relevant information more difficult.

This thesis is presenting a concept describing requirements needed for development of knowledge base of international market information. The knowledge base is trying to provide a solution for integration of knowledge within Laurea's environment and offers answer how users of the knowledge base can benefit from the information flow in Laurea. It promotes platform for easier access and sharing of internationally related information and knowledge and simplifies the process of knowledge transfer within the project stakeholders.

3.4 Knowledge management and knowledge organization

There are several traditional definitions of knowledge management (KM). However, Malhotra (2000) is integrating an additional aspect of increased flexibility and changing pre-defined determinants in current environment to his definition: "Knowledge management caters to the critical issues of organizational adaption, survival and competence in face of increasingly discontinuous environmental change. Essentially, it embodies organizational processes that seek synergistic combination of data and information processing capacity of information technologies, and the creative and innovative capacity of human beings." The intersection of organization, information and human resources is shown in Figure 6 on the next page (Awad & Ghaziri 2004, 3).

In order to acquire new knowledge, in every organization it is required to actively develop and maintain its existing knowledge base. The knowledge base gives comprehensive view on organization's activities and serves as a basis for management and decision making (Von Krogh, Nonaka, Nishiguchi 2000, 17). The users of knowledge base benefit from provided information and tools which enable effective performance within organization's departments and teams (Hildreth & Kimble 2004, 176).

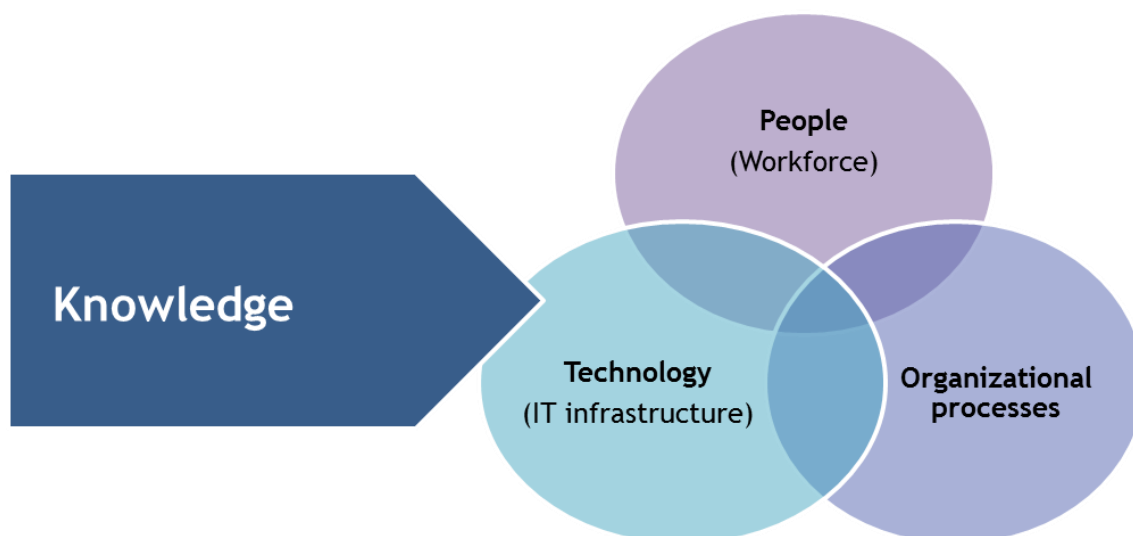


Figure 6: Human, organizational and technological factors of KM

3.5 Application of the term within thesis project

In the introduction section of this thesis terms such as knowledge and knowledge base are used and theoretically explained in previous chapters. However, there is a closer comparison needed in order to assure correct understanding of the project for the reader.

Knowledge base theoretical definition is not precisely consistent with the final outcome of this thesis project. The content of the knowledge base can be defined more as a data or information and can accomplish requirements of the knowledge base definition only when put into wider context. Users of the knowledge base are also a determining factor whether the final outcome of the project can be referred as a knowledge base, database or information base. In order to attain the essentials of knowledge base pretext it is necessary to mention the need of application of the output into broader perspective and assure user's interconnection with other subjects related to the topics in the theory of knowledge.

Finally, despite the fact that the overall product or service of this project does not match the definition of a knowledge base in theory, for the purpose of this thesis, the final outcome of the project will be still referred as a knowledge base throughout this paper. The character of the knowledge base, the users' interface and overall look of the knowledge base will be referred as knowledge base design. Furthermore, the process of creation, organization and management of the knowledge base will be referred as knowledge base building or designing a knowledge base.

4 Knowledge base building process in organization

The knowledge base engineering process in organization is an extensive process including several tasks in model designing and requires advanced knowledge about information systems and applications. Although this chapter of the thesis pays attention to the process of database system creation in an organization, it will emphasize on the planning process of database creation and design. This is mostly due to demanding character of the database engineering process and the limitation in the scope of this thesis. The comprehensive description of database application lifecycle according to Connolly & Begg (2002, 271-272) is shown in Figure 7.

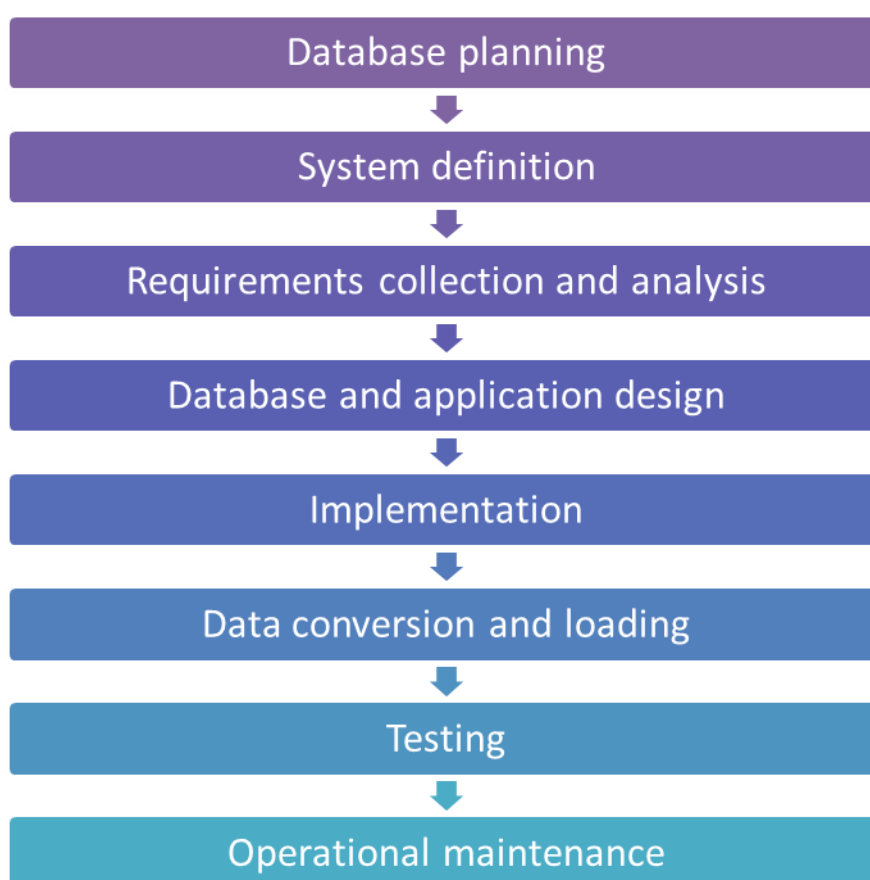


Figure 7: The database application lifecycle

4.1 Database planning process

The process of database planning must be consistent with overall organization's strategy regarding information systems. While planning the creation of a database it is essential to answer following main questions: What are the organization's aims and needs concerning information systems? If existing, what are the positives and negatives in current information

systems? How to distinguish the database from other organization's databases, how to make the database more competitive? Answering these questions will define the organization's needs in terms of information systems. (Connolly & Begg 2002, 273-274)

4.2 System definition, requirements and analysis

The system definition describes the potential of the database application and its limitations. Furthermore, it also defines the major user views of the database which are dependent on particular user's position (such as student, lecturer, project worker or business partner) or organization's area of application (such as internationalisation, marketing, human resources or management).

The analysis of current database is required in order to assure effective functionality of a new database system. Existing database is not automatically in electronic form. There are still some organizations where information has been stored in forms, working papers, index cards and folders. This type of database is called legacy, paper-based or inherited database (Hernandez 2003, 80). The analysis of the new database potential, limitations, user views and existing databases is essential for identification of the users' requirements of the new system. (Connolly & Begg 2002, 274-276)

4.3 Database application and design

Effective database system construction has to follow several design requirements, such as simple and easily adjustable structure of the database and data content, information in the database should be easy to retrieve. Moreover, the development of database applications for end-users and programming tasks should not be unnecessarily time consuming in order to simplify database building process. Following these requirements will make the construction of database easier for content contributors and also enhance effectiveness for database users. Data handling and manipulation will be easier and information flow will be less challenging. (Hernandez 2003, 34)

There are several approaches available in database design modelling. However, the purpose and scope of this thesis allows providing only brief description of design models. More extensive analysis is available in various publications (Connolly & Begg 2002, Hernandez 2003, Schreiber et al. 2000 and others) and can be more beneficial especially for more experienced readers in database systems and programming.

There are two main theoretical models used in database design: "bottom-up" for smaller and simple databases and "top-down" for more complex databases. "Bottom-up" approach

“groups attributes into relations that represent types of entities and relationships between entities”. Alternatively, “top-down” approach “contains a few high-level entities and relationships and then applies successive top-down refinements to identify lower-level entities, relationships, and the associated attributes” (Connolly & Begg 2002, 279).

4.4 Implementation

Implementation process basically means the physical realization of above mentioned applications and database design. It can be achieved by defined as the physical realization of the database and application designs. It is achieved by application of computer programming language or syntax which defines data structure of the database - Data Definition Language (DDL). Another technique of database implementation uses a database interface programs or graphical user interface (GUI), which allows users to interact with the database environment. Implementation of the application programs is utilized by using conventional host programming languages, such as Visual Basic, NET, COBOL, or Java, which contain embedded structure query language (SQL) statements. Structure query language enables users to create database and table structures, data manipulation and administration. (Coronel, Morris, Rob 2011)

4.5 Testing and operational maintenance

Database testing is required in order to find possible performance errors in application programs and database structure. In other words, testing guarantees that database functions in general are working according to their specification and the users' requirements are fulfilled. Furthermore, testing results provide valuable information for developers in terms of software reliability and quality. Operational maintenance is following the testing stage and aims at possible reorganization and adjustments in database structure. In some cases it is also required to implement updates in database application. (Connolly & Begg 2002, 293-294)

With the increasing concerns about data privacy and security, Coronel et al. (2011, 386) recommends that testing process is also performed in following areas: physical security, password security and access rights, data encryption, electronic trails of a database user and download restrictions.

4.6 Microsoft SharePoint

The capabilities of the knowledge base presented in the following chapters of this thesis do not require utilization of specialized expert database management systems, but rather more simple solution for data organizing and sharing. Microsoft SharePoint is one of the

recommended applications which can be also used by non-experts in database systems and information management field.

Microsoft SharePoint (MS SharePoint) is a business collaboration platform providing various tools for effective information management and sharing within enterprises and Internet. Furthermore, the application helps in systemization of business processes, collaboration, and interaction with others. MS SharePoint is the fundamental component of the Microsoft Office (MS Office) system, which incorporates applications, servers, and services created to improve individual and team productivity, make information sharing more effective, and assist in processes related to business decision-making. The solutions of the application include document management, project management, business intelligence and reporting. Some of the capabilities of MS SharePoint are listed below:

- (1) Sites: Share Point is an integrated infrastructure for providing intranet, extranet, and Internet for businesses in one single solution. These sites and the information within them are accessible through standard web browsers, MS Office programs, and mobile devices for management, project teams, partners and customers.
- (2) Communities: One of the key purposes of Share Point is to deliver collaboration tool for people to effectively work together. Collaboration tools are available allowing tams to work together on efforts. Tools are also provided that enable people to connect and communicate with one another.
- (3) Content: SharePoint includes a comprehensive set of capabilities for document management, record management, and web content management.
- (4) Search: People's overall effectiveness can be increased if they are able to quickly localize relevant information. SharePoint provides enterprise search tools that can be used to search across content, people, and data throughout the organization.
- (5) Insights: SharePoint allows everyone to access information in databases, reports, and business applications. Enterprise data is incorporated into solutions which makes corporate data more broadly available and simplifies locating of information for users.
- (6) Composites: SharePoint is an enterprise solution platform that includes a wide range of tools and interfaces that can be leveraged to create comprehensive, cost-effective, do-it-yourself business solutions. (Bates & Smith 2010, 1; Microsoft Corporation 2010, 2-3)

5 The project

This thesis is offering a concept describing requirements needed in order to develop a database (for the purpose of this thesis referred as knowledge base) which aggregates information about foreign countries, its markets and industries, supporting organizations and international issues as such. Furthermore, knowledge base comprises also information about foreign students as a human resource for Finnish businesses intended to expand internationally. The project and functionality of the knowledge base is tailored to needs of educational environment and Laurea UAS in particular. The project is also closely related to international students, their internship and employment opportunities in Finland, as well as internationalization of Finnish SMEs and Laurea's international projects, courses and personnel involved in international activities.

The idea of creating a virtual environment for collecting international information, its organization and sharing in Laurea is based on the aims and outcomes of the project "Internationalisation of SMEs". The project describes development of database of relevant sources of information related to internationalization. The content of the database is acquired mostly through work of students on the courses in Laurea, from their assignments, reports and project work. Additionally, this concept of gathering sources of information from Laurea's students and their course reports is extended with other related ideas from international projects in Laurea, which are described more in detail in section 2.4 of this thesis.

Following sub-chapters are based on results of "Internationalisation of SMEs" project development, discussions with project management (Jäättelä, Discussions with project manager. January 2011 - June 2011), Laurea lecturers, meetings with related projects staff (Development of English Degree Programmes project meeting. 27 September 2011) and student surveys (Tuomola 2009)

At this point it is essential to explain the difference between the project of international knowledge base building itself and international projects in Laurea in general. As mentioned earlier, the concept of building the international knowledge base in Laurea cannot be considered as independent and separate project but more likely as an aggregate output of several international projects in Laurea. The outcomes of international projects which are involved in the knowledge base building process are not limited; nevertheless their unifying factor is supposed to be the focus in international matters.

The project of building the international knowledge base does not use an abbreviation - therefore it is referred as the knowledge base building project throughout this thesis.

5.1 The purpose behind the knowledge base creation

One of the main reasons for developing a database of international information is to provide support for Finnish SMEs to expand their operations abroad. There are many ways for SMEs how to retain knowledge, one of them including the practice and use of knowledge databases. Although sophisticated data mining techniques are often too costly for SMEs, implementation of small databases can offer the appropriate solution. For smaller companies - additional external help might assist them in implementing knowledge acquiring (Wickert & Herschel 2001, 333). And this is one of the proposed roles of Laurea UAS described in this thesis.

Laurea as a higher education institution with its numerous research projects, courses, and recognized international competence can provide inexpensive and less time-consuming solution especially for SMEs, often troubled with limited resources. The cooperation between education and business sector has been implemented in Finland already a while ago and this experience can be also vital in the project of international knowledge base building in Laurea.

International students coming to study to Laurea from different parts of the world are another essential asset in creating the knowledge base. They can actively participate in the content building of the knowledge base. Closer interaction with businesses from Finland will expand their employment opportunities and assist them in professional growth and development of their competences. International students possess valuable knowledge about their home countries, business operating environment which can provide useful information in building new networks abroad.

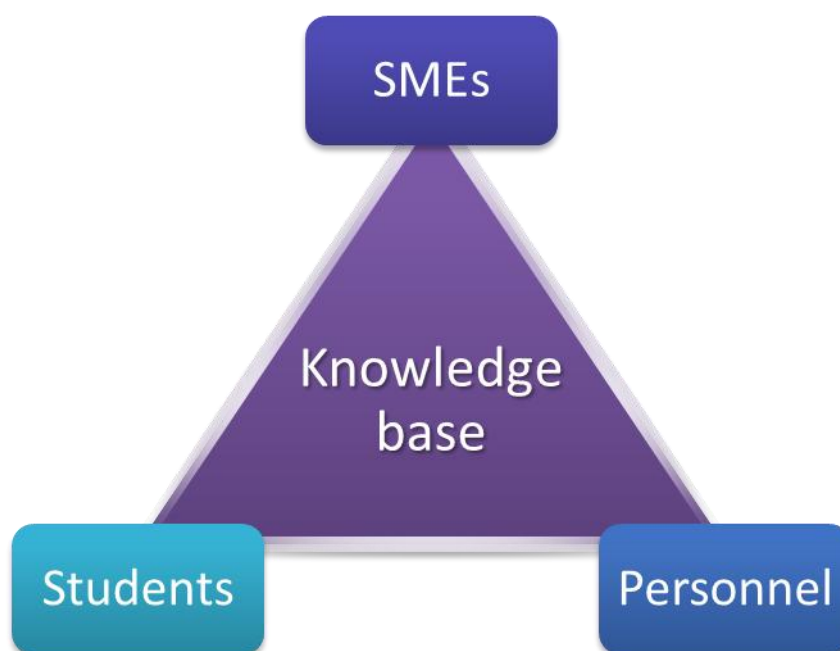


Figure 8: KB integration within stakeholders

According to the results of a survey among students attending English degree programmes in Laurea (Tuomola, 2009) there is lack of information concerning internship opportunities especially for international students. Although there is designated environment in Laurea intranet for internships matters, relevant information is often difficult to find, the content is lacking regular updates, and it is difficult to use. One of the functions of the knowledge base aims to provide platform for organizing information about students' professional skills and competences and match them with companies' demands in the field of human resources.

Finally, the knowledge base can serve as a tool for sharing information between Laurea's personnel and support the development of new ideas in lecturing process and minimize duplicity in course material and lecture presentations. Currently, Optima working environment is generally used for these purposes, although creating a separate platform focused on international matters could better address international issues and comprise several course curriculums into a single compact environment. However, extend of this thesis does not allow to explore the justification of this challenge in more detail and therefore closer examination of this particular purpose is needed among Laurea's personnel.

5.2 Project aims and objectives

There is a need for better cooperation between the projects in Laurea and support communication as a key factor in every stage of a project development. The determining factor of international knowledge base creation is the integration of international projects in Laurea and providing a comprehensive platform for international knowledge acquisition, distribution and sharing. Aggregation of such knowledge can benefit internal users in Laurea as well as external uses represented by business sector.

Successful implementation of the knowledge base will enhance information flows, promote cooperation and networking, and facilitate human resource pool as an agent for students' competence matchmaking with the requirements of business partners.

The main objective of the international knowledge base in Laurea is to facilitate and utilize information about international projects, markets and theory and provide a platform for international students to find internship and employment opportunities. The main goal can be achieved by following several partial steps:

- Accumulation of international information from projects and courses in Laurea UAS.
- Accumulation of specific references to sources of information about different countries, industries and markets.
- Integration of links to other external sources of international information.
- Creating a format of templates for uploading the information to the knowledge base.
- Facilitate the organization of students' competences and companies' demands.
- Promoting internationalisation and cooperation in Laurea (SID labs, personnel, projects, students) and towards other institutions and partners.

5.3 Content of the knowledge base

The knowledge base will contain information related to internationalisation with relevance to Laurea's educational environment and its projects, personnel and students. The knowledge base content includes references to sources and market information gathered from courses, projects in Laurea, and external sources, international theory from lecture presentations and course materials, human resources marketplace - linking of students' skills with the needs of companies in terms of internship and employment possibilities. (Development of English Degree Programmes project meeting. 27 September 2011)

The content of the knowledge base content is shown in Table 1. The description of main content areas is based on discussions and interviews with personnel in Laurea (Jäättelä,

Discussions with project manager. January 2011 - June 2011). The content consists of country information, relevant potential contacts of interest, information related to internationalisation, information about students, opened positions and international theory. Each content area is described in more detail in following paragraphs.

Content	Description
Country, industry and market information	<ul style="list-style-type: none"> • As an outcome in students' reports • General country information such as political, economic, legal, social and technological environment • Reference links to external publicly available country reports
Relevant potential contacts of interest	<ul style="list-style-type: none"> • Based on students' work on courses • Listed as an attachment in every relevant report related to internationalisation matters • References to public sources of information such as potential partners, distributors, competitors, governmental and support organizations and networks
Free zone - information related to international issues	<ul style="list-style-type: none"> • Available to all users of the knowledge base • Information freely submitted and edited • Open accessibility • Reference links to external publicly available sources of information
Students' information	<ul style="list-style-type: none"> • Information optionally submitted by students on internship introduction course • Students' CVs • Relevant students' background information, their skills and competences
Opened positions	<ul style="list-style-type: none"> • Project, internship and job vacancies available from business partners • Reference links to Laurea's internship offers and Laurea intranet internship forum
International theory	<ul style="list-style-type: none"> • Submitted by lecturers with limited accessibility • Lectures, presentations and course material related to internationalisation

Table 1: Content of the knowledge base

General information about countries and specific markets are accessible from many public sources of information. Furthermore, several study units in Laurea are oriented in analysis of particular operating environment in different countries. However, it is often difficult to localize relevant sources for finding required information and the research process is usually

lengthy. “**Country, industry and market information**” section of the knowledge base can address these issues and provide organized analyses of countries supplemented with information about specific markets and industries. It will also provide external sources about previously mentioned topics.

One of the direct outcomes from students’ reports that will contribute to the content of the knowledge base is information about “**potential contacts of interest**”. Students encounter numerous company contacts while investigating sources for their course reports. These companies can represent potential customers, distributors, competitors or partners for Finnish businesses expanding abroad, hence the organization of such information is essential.

The “**free zone**” section of the knowledge base provides place for uploading unsorted information, such as current issues, links to relevant articles, news and other publicly available information. The only unifying factor will be the internationalisation subject of the content.

The information about students, their CVs, competences and skills is object of another subcategory of the knowledge base - “**students’ information**”. Students’ background and relation to various countries and markets will be accentuated in the database. This information will be essential for Finnish companies in the process of human resource search for targeted markets in their internationalization process. Factors, such as knowledge of domestic culture and environment, language and possible connections can play significant role in company’s decision during hiring process. On the other side, the database offers an opportunity for students to market their professional skills and assist in their internship searching process.

The subsection “**opened positions**” will serve as a counterpart to students’ information described in previous paragraph. “Opened positions” will give opportunity to companies involved in projects (and not only those) to seek potential human resources from Laurea’s student basis. One of the great advantages of students in Laurea is their international background. They are coming from different parts of the world and they pose valuable knowledge about their home countries, cultures and business practice which can benefit many Finnish companies with international ambitions. Students can also assist companies in the very beginning stage of establishing international networks.

Finally, the content of the knowledge base will include “**international theory**” section. Presentations and lecture materials will be gathered and available for Laurea’s personnel involved in study units involved in internationalisation. Furthermore, the section will contain links to libraries and online search engines which can provide sources for theory in international business and internationalisation.

The content of the knowledge base proposed in this thesis is not static, nor fixed. The main structure can be modified according to users' needs and requires systematic updating plan in order to follow current trends and situation in Laurea, Finland and international business environment in general. Particular sections can be adjusted, removed or added to provide the best possible outcome and offer accurate and up-to-date solution for finding information related to internationalisation. It is essential to keep statistics and monitor visits of the knowledge base environment in order to reveal the popularity of each section. Additionally, users' feedback and suggestions can serve as a vital tool for implementing adjustments and providing satisfactory service according to users' requirements.

5.4 Users of the knowledge base

It is expected that during the initial stage of the knowledge base implementation main users will originate from Laurea and its environment. The main group of users will be represented by personnel in Laurea, SID labs and related international projects and Laurea's students. They will be followed in the later stages of the knowledge base development process by external users from cooperating companies, organizations, and partner educational institutions. However, the general content of the knowledge base will be publicly available. The users will be granted access to the knowledge base with differentiated accessibility to the content, depending on the position, role and level of user's involvement in international activities within Laurea's environment.

5.4.1 Laurea personnel

Personnel in Laurea will be able to access the knowledge base without restrictions, participate in content building and allowed to edit the content submitted. The main benefit for personnel is underlined in lecture material sharing among others in this user's group. Lecturers will be able to share their presentations with other colleagues to support cooperation and communication and to contribute to better theoretical study offer in the curriculum of their courses. Information about projects will offer opportunity for Laurea's personnel to learn about current activities and possible areas for collaboration. As mentioned before, Laurea's staff members will have unrestricted access to the knowledge base content, with the exception of confidential project information concerning external stakeholders.

5.4.2 SID labs and international projects

SID labs are endorsing large number of internationally related projects. Information from these projects can provide useful source for content building of the knowledge base. Project

management teams and research interns involved in projects can benefit from information in the knowledge base. Furthermore, knowledge base can provide a platform for sharing project information and material with external partners. Each project can adjust the availability of project content availability for different users. Depending on the character of information included, project material can be publicly available or restricted to be accessed only by particular user groups taking into consideration confidentiality of information.

5.4.3 Students

Another significant group of users is represented by students. They will have opportunity to upload their personal information which will serve as a human resource base. Companies offering internship and employment positions with specific knowledge or skill requirements will be able to match their demands through such a database.

Students will also be able to search submitted material in country information section, potential contacts of interest and free zone. The last mentioned will also allow them to submit any uncategorized publicly available information which is related to the topic of internationalization. Furthermore, students will have limited accessibility to course material according to their personal study plan and participation on study units.

5.4.4 Business partners

Business partners will have access to submitted students' information such as their CVs, skills and responsibilities. They will use this platform as a tool for finding appropriate human resources from student resources. It will allow companies to match exactly their requirements. Furthermore, companies will have access to the sources of information about country and market analysis and potential contacts of interest produced by students. For the needs of companies data will be structured by several parameters such as subject, country and industry.

Partners cooperating with Laurea in different projects will have also access to information regarding those particular projects. It will simplify coordination task and enhance communication within the project stakeholders as this was very common problematic area before which occurred frequently in the past. The experience shows that companies are very often occupied with their own activities thus their participation suffered because of these difficulties. This also negatively affects the whole process of project development and therefore knowledge base should address these' problems and assist to eliminate them.

In order to provide protection of confidential and personal information and also address copyright issues, different access limitations for particular user groups can be applied.

5.5 Sources of the knowledge base content

In order to successfully create functioning and useful knowledge base for its users it is necessary to define data and information content and its sources. In the case of Laurea's international knowledge base, content will be created mostly through course work of students, with additional input from Laurea's personnel, SID labs and business partners.

Students represent the main contributors in the content of the knowledge base. The collection information about countries, industries and markets as well as potential contacts of interest will be implemented into students' study programme and integrated into curriculum of study units related to internationalization. There are several courses in Laurea which agreed on cooperation in the project and integration of knowledge building process; for example: "International business operations", "Global operating environment", "Strategic business-to-business marketing management", "International sales and key account management", "Managing international risks" and "Highlighting a target market". In the future there is a potential for extending of the cooperation with other courses, other Laurea's units and partner universities.

The outcome of students' work on cooperating courses will be summarized in "Template for uploading country, industry and market information" and "Template for uploading company/organization information" (Appendix 1 and Appendix 2 respectively). Attaching these templates at the end of every report will be obligatory for students participating in particular study unit. Students will be also responsible for uploading these templates into the knowledge base. This will ensure the uploading continuity and constant knowledge base content increase.

Another template for students will be provided for uploading personal information (Appendix 3). The collection of students' information, their background, skills, competences and interests will provide useful tool for companies searching for specific human resource attributes and capabilities. Uploading of students' information will be voluntary and a responsibility of students. Students will be introduced to the possibility of providing their personal information for companies' recruitment purposes during their "Introduction to internship" or "Information retrieval" course unit participation.

Laurea's lecturers represent other contributors to the knowledge base content. They will be mostly responsible for uploading international theory information related to particular study

unit. The content of the international theory will be shared within lecturers and students participating on the course. Accessibility to the material can be also granted to other users of the knowledge base, depending on the decision of person responsible for uploading. The international theory will contain mainly presentations and course material. The copyright and intellectual property rights will be ensured by access restrictions.

Finally, external business partners and Laurea's project management personnel will be responsible for uploading information about opened positions for students - internships and employment. Business partners will post their requirements with the assistance of responsible Laurea's personnel. Information about vacancies will be available for users within Laurea's network.

In addition, uploading of content to the "Free zone" will be available without restrictions for all knowledge base users. The only limitation for contributors is the content required connection to internationalisation or internationally related issues. The content will be reviewed by administrator.

6 Practical implementation

The process of knowledge base building and its successful implementation in practice has to be managed as an independent project. Currently, the idea behind international knowledge base is developed on outcome proposals of the project Internationalisation of SMEs. However, the concept introduced in this thesis is covering wider area and including also other international projects in Laurea UAS. It is recommended that the process of knowledge base building is separated from Internationalisation of SMEs and becomes autonomous project, however, with close connection to other projects related to internationalisation. In addition, there is a need for identifying human resource for the project, its management structure and other supporting personnel. Although the human resource requirements for the process of knowledge base building are not high, they must be defined and applied in practice.

6.1 Project stakeholders and benefits

The project stakeholder organization is shown in Table 2 (based on Jäättelä, 2011) on the next page. There are four main groups recognized: Laurea UAS (including personnel, SID labs, interns and Laurea's projects), students, partner educational institutions (cooperating universities in Finland and abroad), and business partners (companies, SMEs, funding and support organizations). Based on stakeholders' relation to the knowledge base they can be divided into:

(1) **Contributors** to the knowledge base - this group include stakeholders actively participating in content building of the knowledge base of international market information.

(2) **Users** of the international knowledge base - represented by stakeholders benefitting from the content of the knowledge base of international market information.

Stakeholder	Benefits
Laurea UAS	<ul style="list-style-type: none"> • Accumulation of information related to international markets and operating environment • Enhancing cooperation with business environment • Networking and collaboration of projects • Potential new opportunities and partners • Theoretical base for educational process and improvement in lecturing process
Students	<ul style="list-style-type: none"> • Information source for desk research • Communication with other students of international issues • Internship and employment opportunities • Support for course assignments and projects
Partner educational institutions	<ul style="list-style-type: none"> • Assistance in finding areas of potential cooperation • Information exchange • Promotion of networking • Widening the scope of collaboration in educational sector in Finland and abroad • Assistance in knowledge base development, suggestion and implementation of new ideas
Business partners	<ul style="list-style-type: none"> • Human resources with international background • Finding international connections • Preliminary market and environment analysis • Overcoming language and cultural difficulties in target country markets • Areas of cooperation and potential partner search

Table 2: Project stakeholders and benefits

With Laurea emphasizing on research, development and innovation activities and increasing number of projects, project personnel and external partners, information flow becomes more problematic and imprecise. With the introduction of international market knowledge base all associated information will be gathered and shared in one recognised place. The accumulation of information and knowledge related to international markets in a

comprehensive and compact platform will deliver several benefits for stakeholders and users of the services:

- Promoting greater efficiency and time saving
- Supporting communication and information sharing
- Offering advanced searching features supplying focused information
- Comprising international information in one compact platform
- Improving connection between education, business and students
- Facilitating human resources offer from students and demand from business environment

During the initial stage of knowledge base practical implementation it will serve mostly stakeholders within Laurea and its environment - personnel and students. With increasing volume of information and number of users the importance of the knowledge base will also grow outside Laurea. External stakeholders represented mostly by partner universities and businesses involved in research and development projects will also benefit from the knowledge base content in the later stage of implementation. It can serve as a useful tool for project desk research and as a starting point for international market research and analysis.

6.2 Database design and implementation

Currently, the development of the knowledge base has been suspended. However, there is significant number of documents and data collected from the past which is sufficient for assuring functionality in the initialization process of the knowledge base operation. Creating the knowledge base electronic environment and technical issues related to knowledge base building process are the primary tasks needed for project implementation into practice. These tasks are defined in this chapters, following Connolly's and Begg's principles of database application lifestyle (2002, 271). The process can be divided into two main stages in order to assure knowledge base functionality:

(1) **Database design** - including tasks such as design of the knowledge base, organizational structure of the content, system of uploading information, users accounts, unification and integration of uploading sources and other technical issues. This part also includes the preliminary content of the knowledge base launch. This stage has exact plan of implementation.

(2) **Database implementation** - this includes implementation, data loading, testing and operational maintenance. For simplification, all these processes are referred as "database/knowledge base implementation" in this chapter. This stage assures the

sustainability of uploaded information, cooperation with knowledge base contributors and up-to-date content. This part of the project is following the knowledge base design stage; it is continuous and has no exact time limitations.

The realisation of the project in two stages is shown in Figure 9 below. First stage - knowledge base design includes tasks required for creating the operational environment and interface of the knowledge base in order to assure functionality for its users. The responsibilities in this stage include:

- Decisions about server location, hosting account and domain name
- Choosing adequate software for database creation
- Decisions about knowledge base design, user interface and structure
- Evaluation and implementation of additional functions
- Data content input
- Functionality testing of the knowledge base and resolving faults

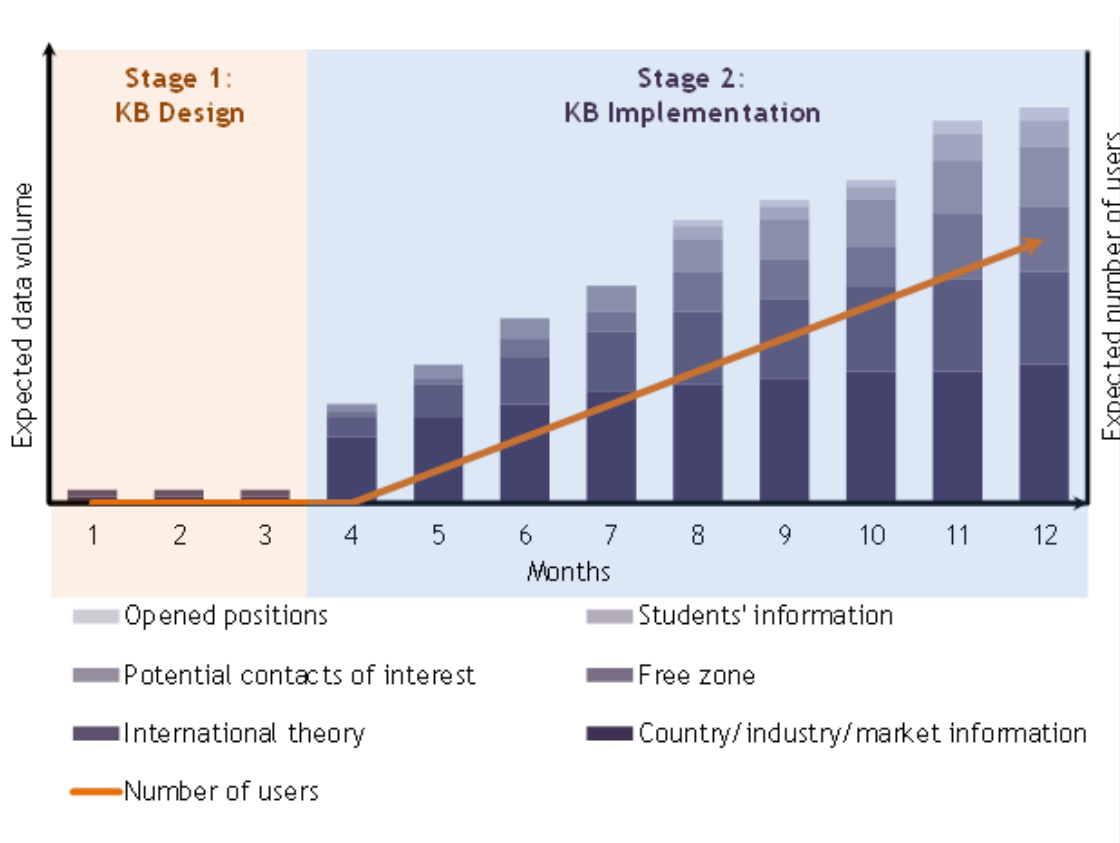


Figure 9: The stages of knowledge base building development

These tasks require adequate skilled person in the field of information technology, however, it is not necessary to hire professional or outsource services from external providers. Laurea's

Business information technology degree programme can provide human resources required. These tasks can be implemented by students as a part of their studies and job placement.

The second stage - knowledge base implementation - is immediately following the knowledge base design stage. KB implementation is persistent process without time schedule definition. It includes tasks required for day-to-day operational processes related to knowledge base functionality. It mostly involves cooperation with persons responsible for uploading information and synchronizing these procedures with from different sources. Furthermore, there is a need for continuous organization of the content and persistent examination of new sources of information. This process also includes improving the quality of service which the knowledge base offers, resolving possible drawbacks in functionality, and dealing with users - their experience, comments and feedback. The human resource requirements for both building and administration stage are described in detail in the following subchapter.

6.3 Project organization

The requirements for successful implementation of knowledge base building project in the field of human resources have to be met. Project planning process in terms of human resources includes definition of work requirements, quality and quantity of work, resource requirements, activities and risks (Kerzner 2009, 3). For the purpose of this thesis, only the main human resource needs and their activities will be defined in the following paragraphs:

(1) **Project manager** - person responsible for coordination and decision making in the project, overlooking the process of the whole project and directing tasks to subordinates.

(2) **Project worker** - assistant - person responsible for daily tasks, content of the knowledge base and communication with project stakeholders and users.

(3) **Technical assistant** - person responsible for technical issues regarding the knowledge base virtual environment, maintenance, tasks related to uploading and editing of information, and technical problem solving.

It is essential to exactly specify human resources for both stages of the project implementation - knowledge base design stage and knowledge base implementation stage. Logically, the project manager position requisite is defined throughout the whole project duration in order to assure successful project organization and allocation of tasks and duties to the rest of project personnel. The position of project manager is not extensively time demanding and can be provided by a person from specialized personnel in Laurea in the form of additional work task.

The technical support of the project will be necessary particularly during the process of knowledge base designing stage. The position of technical support requires fulltime assistants in the beginning stage of the project with additional support during implementation stage. There is a possibility to satisfy this human resource demand by employing students from Business information technology programme in the form of internship positions.

Project workers will interact with users and contributors to the knowledge base and their role will consist of knowledge base functionality regulation, overseeing character and recency of uploaded content and also coordination of uploading process from different sources.

6.4 Challenges in the project

The process of knowledge base building is not an easy task and requires resources, both human and financial. There have to be committed personnel and management in order to assure proper functionality of the database. The objectives and tasks will have to be exactly defined and the process of realization will have to strictly follow the plan. Moreover, there are particular areas which require exceptional attention: consistency of the project, updating conformity and knowledge base project integration into Laurea's environment.

6.4.1 Project consistency

One of the requirements of effective implementation of the database into practice is the project consistency. The main challenge here is connected to the environment of Laurea UAS as an educational institution: there are new students arriving every year; the exchange students are attending Laurea only for limited time; academic year has long breaks at the end of each semester. These factors affect project's consistency and require special attention and planning. Furthermore, project human resource management requires additional planning and training provision. The fluctuation of project personnel is expected to be high as students will rotate on particular positions during their studies.

With attention to previously mentioned issues there is a necessity of continuous implementation of the project through academic year. Project management and students involved in the project will have to assure that the database functions will be uninterrupted. Actualization of the database and maintaining "up-to-date" content is the key requirement for accurate performance and outcome.

6.4.2 Updating conformity

The content of the knowledge base is extensive with high number of participants contributing to the database by uploading information. Students, Laurea's personnel and project workers - they all will be participating in uploading of information to the database. In order to organize the updating process of the knowledge base it is necessary to simplify and unify the "carriers" of the information from contributors to the users. These "carriers" or spread sheets will be in the form of templates for uploading information. The templates will be used in order to achieve conformity of the content in the knowledge base (Template 1, 2 and 3 in the attachment of this paper). The templates will also simplify the process of uploading and provide a tool for better categorization of the content and easier searching within the content of the database.

6.4.3 Project integration in Laurea's environment

Another challenge in the process of international information database building is lies in integration of the uploading processes into operations of Laurea and its study programmes, courses and projects. The rules for information uploading have to be precisely set on every level: for students, for personnel and for project workers.

The sources of information about countries, industries and markets (Appendix 1); and also companies and organizations (Template 2) will have to be implemented in students' course work as a part of compulsory outcome of particular study unit. Courses cooperating with the knowledge base building project will define the obligation of participating students to upload the information templates automatically.

For Laurea's personnel, the information sharing within the database can be more demanding. More actions are needed to assure lecturer's awareness and understanding of benefits through implementation of knowledge base. Gathering theoretical framework related to international issues and its sharing can certainly positively affect development of international competences in both - study process and Laurea's activities.

Finally, the personal information of students will have to be implemented as a part of their acceptance to Laurea. Students will have to fill basic information about their education, professional experience and skills (Appendix 3) as a part of studies. There are few options in proceeding: the information could be collected during their internship introduction course, during their information retrieval course or later in their studies. This information about students could not be shared with third parties without students' permission. If personal information about students is collected in their second year studies, there will have to be

common procedure developed for proceeding in such a process. This might be a challenging task taking into consideration the variety of students' background and their study programmes.

7 Conclusions

Creating a database generally includes several demanding tasks which can often represent a challenge for developers of the database. Moreover, when a database building project involves various stakeholders interconnected internationally - the challenges are emphasized in terms of project management, organization and coordination. The project presented in this thesis describes a concept of requirements for creation of a knowledge base containing various sources of international information at its core. This paper describes step-by-step solutions for database development in the environment of Laurea UAS. This database of international information can serve different users and provide assistance for students, personnel and external partners. The project corresponds with the global trends in enhancing collaboration, utilization, information sharing and networking.

Based on the analysis of theoretical framework and following the structure of database creation from various sources, this thesis defines the knowledge base creation in terms of objectives, content, users and sources for the database, and in terms of project organization, stakeholders, resources and timetable.

The main objective behind the concept described in this thesis is to design a concept of requirements utilized to aggregate information related to international issues in one comprehensive platform. The platform will work in the environment of Laurea UAS and accent the educational character of Laurea as University of Applied Sciences. Content of the knowledge base will comprise international country and market information, contacts, theory of internationalisation, and support tool for matching students competences with partner companies need. There are already several projects involved in assistance to international students in terms of job placement and employment. The knowledge base tool could help to support these projects' aims.

The users of this platform are limited at the beginning stage only to Laurea environment and will include students, personnel and partners directly connected to Laurea and its activities. There is a potential for development of the concept beyond limitations of Laurea and they are elaborated in following paragraphs of this thesis. The sources of information for the database will be collected via templates (see Attachment 1, 2 and 3) during study process of students. Additional important contributors to the content are represented by Laurea's

personnel and their lecturing process with possibility of external partners' assistance in knowledge base content building process.

Laurea UAS, students, partners educational institutions and business partners are among the stakeholders in the beginning stage of the project development. The involvement of additional stakeholders, such as support organizations, government and municipality organizations, is possible in the later stages of project implementation. Human resource requirements consist of project manager, project workers and technical assistants. All mentioned personnel can be utilized from Laurea's internal resources and students. Overall project costs consist mainly from salaries and other staff costs and generally should not exceed € 90.000 per year. Furthermore, additional expenses are planned in the first year of the project development. This is mostly due to increased managerial and technical assistance requirements related to project platform creation.

7.1 Project impact and applications

The main aim of the project is to define and describe a concept of virtual environment requirements which comprises of information database, searching engine and communication hub, connecting stakeholders and users from Laurea involved in international business environment analysis. In practice, the platform will serve its users as an online environment providing accumulation and distribution of international information within Laurea and its stakeholders. Information gathered in the knowledge base will promote development of internationalisation and networking. The increasing number of persons involved in the knowledge base development - contributors and users - will represent substantive potential for development of international networks and contacts. Furthermore, successful project implementation will provide united platform for other projects related to international issues. Information about students will also assist in searching for internship and employment opportunities. Finally, foreign markets will be more easily accessible for Finnish SMEs through Laurea's students.

Knowledge base proposes very comprehensive source of international information. Students in need of information regarding international issues can use the database for their studies and search within the database using advanced methods. It will assist them in their course work and assignments and it will contribute to enlarge their knowledge about internationalisation. Once the project is successfully developed to larger extend in Laurea, there are many possibilities to expand the knowledge base platform to other Laurea's partner universities. More universities involved in the project will increase the potentials of the knowledge base and support relations and partnerships.

For the teaching personnel, theoretical framework related to international issues will be gathered. It will promote the flow of information between particular study units and lecturers and support the learning process of Laurea's students. Sharing international knowledge from various sources will also assist in improving course quality, refining curriculums and applications for practical part of studies.

7.2 Development proposals

Database systems and knowledge base development, knowledge management and organization - these all alone are very extensive topics and cannot be fully elaborated in this bachelor's thesis. Although this paper partly describes the theoretical framework of mentioned topics, further analysis is needed in order to practically advance in implementation of knowledge base project.

Database engineering itself is an uneasy task and requires specialized knowledge and technical expertise. Although there are suggestions for software to be used for the project development and their brief explanation, there is a need for further definition of potential software availability and applications. The concept description neither takes into consideration the design or graphical environment in user's interface. Furthermore, the technical issues of information uploading, searching and organizing the information is not explained to sufficient extend in this paper.

Evidently, there is a need for such a concept of knowledge base for students' use as described (see, for example, Tuomola, 2009). However, the involvement of Laurea' personnel remains uncertain. The privacy issues and intellectual property rights might be still a challenge in sharing lecture materials with others. It is essential to explore the interest of personnel in Laurea and their willingness; the necessity of the knowledge base for use of Laurea's personnel. There are recommended forms for verifying previous statement: such as surveys, questionnaires or interviews with competent persons - lecturers in Laurea UAS. Consequently, the analysis of collected results could give an answer and justify the meaning of knowledge base also from the point of view of lecturers.

References

Publications

Aurela, B. 2012. Service Innovation and Design - Results from co-creation. Espoo: Laurea University of Applied Sciences.

Awad, E., Ghaziri, H. 2004. Knowledge management. Upper Saddle River: Pearson/Prentice Hall.

Bates, S., Smith, T. 2010. SharePoint 2010 User's Guide: Learning Microsoft's Business Collaboration Platform. New York: Springer-Verlag New York, Inc.

Bürgel, O. 2004. The internationalisation of young high tech firms: an empirical analysis in Germany and the United Kingdom. New York: Physica-Verlag Heidelberg.

Connolly, T., Begg, C. 2002. Database systems. A Practical Approach to Design, Implementation, and Management. Third Edition. Essex: Pearson Education Limited

Coronel, C., Morris, S., Rob, P. 2011. Database Systems: Design, Implementation, and Management, Ninth Edition. Boston: Cengage Learning

Danford, G. 2003. Project-based learning and polytechnic-SME collaboration in internationalization. The Case of Helsinki Business Polytechnics. Helsinki: Helia Helsinki Business Polytechnic

Hernandez, M. 2003. Database Design for Mere Mortals. Second Edition. Boston: Pearson Education, Inc.

Hildreth, P., Kimble, C. 2004. Knowledge Networks: Innovation Through Communities of Practice. London: Idea Group Publishing.

Johnson, D., Turner, C. 2010. International Business: Themes and Issues in the Modern Global Economy. Second Edition. Oxon: Routledge.

Kerzner, H. Project Management: A System Approach to Planning, Scheduling, and Controlling. New Jersey: John Wiley & Sons.

Laudon, K., Laudon J. 2010. Management Information Systems: Managing the digital firm. Upper Saddle River: Pearson Education.

Nonaka, I., Teece, J. 2001. Managing industrial knowledge: creation, transfer and utilization. London: Sage.

Nonaka, I. 2005. Knowledge management: critical perspectives on business and management. London: Routledge.

Ponstijn, M. 2009. Internationalization of the Greater Helsinki Metropolitan Area. A research on how to position SID Lab International in order to support a small and middle sized companies in the area. Bachelor's thesis. Espoo.

Schreiber, G., Akkermans, H., Anjewierden, A., de Hoog, R., Shadbolt, N., Van de Velde, W., Wielinga, B. 2000. Knowledge Engineering and Management. The CommonKADS Methodology. Cambridge: MIT Press.

Tsui, E. 2005. Technology in Knowledge Management. Bradford: Emerald Group Publishing.

Von Krogh, G., Nonaka, I., Nishiguchi, T. 2000. Knowledge creation: a source of value. London: Macmillan Press.

Wickert, A., Herschel, R. 2001. Knowledge-management issues for smaller businesses. Journal of Knowledge Management. Volume 5. Issue 4. Pages 329-337

Electronic sources

Finnish Ministry of Education and Culture. Accessed 05. 12. 2011
<http://www.minedu.fi/OPM/Koulutus/ammattikorkeakoulutus/ammattikorkeakoulut/?lang=en>

Garam, I., Korkala, S. 2011. International mobility in Finnish vocational and higher education in 2010. The centre for International Mobility CIMO. Accessed 05. 12. 2011.
http://www.cimo.fi/instancedata/prime_product_julkaisu/cimo/embeds/cimowwwstructure/21273_Faktaa_1b_2011_web.pdf

Laurea UAS. 2010. Laurea - from education to innovation. Accessed 12.12.2011.
<http://www.laurea.fi/SiteCollectionDocuments/Esitteet,%20vuosikertomukset,%20jne/International%20brochure%202010.pdf>

Laurea UAS. 2010b. Laurea's quality assurance handbook. 2010.
http://www.laurea.fi/en/information_on_Laurea/Quality_management/Documents/Laurea's%20quality%20assurance%20handbook.pdf

Laurea UAS. 2011. Annual Review 2010. Activities and results. Accessed 05.12. 2011
http://www.laurea.fi/SiteCollectionDocuments/Esitteet,%20vuosikertomukset,%20jne/vuosikatsaus_2010_ENG_lowres.pdf

Laurea UAS. 2012.
<http://www.laurea.fi/fi/Sivut/default.aspx>

Malhotra, Y. 2002. Knowledge Management for the New World of Business.
<http://www.brint.com/km/whatis.htm>

Microsoft Corporation. 2010. Microsoft SharePoint 2010 evaluation guide for technical and business decision makers. Accessed 16.02.2012.
<http://sharepoint.microsoft.com/en-us/product/benefits/Pages/default.aspx>

Tuomola, N. 2009. Creating student internship database for Laurea University of Applied Sciences. Bachelor's Thesis.
<https://publications.theseus.fi/bitstream/handle/10024/3909/Natalia.Tuomola..pdf?sequence=1>

Valoa project. 2011.
<http://www.valoa-hanke.fi/Default.aspx?tabid=70>

World Bank. 2010.
<http://www.worldbank.org/>

Interviews, meetings, discussions

Aurela, B. Connect project. Discussions with project manager. August 2011 - November 2011. Laurea University of Applied Sciences. Espoo

Jäättelä, R. Internationalization of SMEs project. Discussions with project manager. January 2011 - June 2011. Laurea University of Applied Sciences. Espoo

Aldrete, M., Aurela B., Majakulma, A., Matvejeff, P., Lyaruu, C. Development of English Degree Programmes Project. Meeting with associated project managers. September 27, 2011. Laurea University of Applied Sciences. Espoo

Figures

Figure 1: Thesis main research questions	9
Figure 2: The structure of the thesis	10
Figure 3: International degree students in Finnish HEI.....	13
Figure 4: The dimensions of knowledge	16
Figure 5: Dynamics of knowledge creation	18
Figure 6: Human, organizational and technological factors of KM	20
Figure 7: The database application lifecycle	21
Figure 8: KB integration within stakeholders	27
Figure 9: The stages of knowledge base building development	37

Tables

Table 1: Content of the knowledge base	29
Table 2: Project stakeholders and benefits	35

Appendices

Appendix 1: Template for uploading company/organization information	50
Appendix 2: Template for uploading country/industry information	51
Appendix 3: Template for uploading student's information	52

Appendix 1: Template for uploading company/organization information

Company/organization name:	
Operating markets:	
Area of business/ industry:	
Contact details: (address, e-mail, phone, web)	
Established (year):	
Size: (turnover, employees)	
Company description:	
Products & Services	
Submitted by:	
Date:	

Appendix 2: Template for uploading country/industry information

Topic:	
Country:	
Industry:	
Website address (hyperlink):	
Website organization/provider:	
Content (description):	
Submitted by:	
Date accessed:	

Appendix 3: Template for uploading student's information

Name/Student number:	
Study programme:	
Studies started (year):	
Country of origin:	
Previous education:	
Work experience:	
Language skills:	
Other skills and competences	
Professional interests	
Personal description:	
CV attached (yes/no)	