Information architecture in web design

Case Lähde työelämään - Spring to Work

HAMK
UNIVERSITY OF APPLIED SCIENCES

Bachelor's thesis

Degree Programme in Business Information Technology

Hämeenlinna, Visamäki, __.__.2012

Turo Nylund

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ABSTRACT

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ABSTRACT

The purpose of the thesis was to improve the information architecture of an information system called Spring to Work. The information system is a part of Lähde työelämään - project and HAMK University of Applied Sciences has been coordinating this subproject. The subject of the thesis is picked up from the author's own interest in web design.

The target of the thesis is to find out what information architecture is and what areas it covers. In addition, the thesis will work out the impact of information architecture on web design. Types of skills needed to creating the information architecture are also included in the research questions of the thesis.

Theoretical parts were studied from two main written sources. The sources were used to help build a body of the thesis and outline the research topics. The research method was mainly qualitative, because at the beginning of the thesis, the author did not have any knowledge about information architecture.

The theory has been applied to improve the information architecture of the information system. Alone the theory is not enough to improve the information architecture but also previous knowledge of the information system's context, content and users was used. The design process of information architecture was included as a part of software development and implementation had been made by the software developer team.

After reading the thesis, it is possible to understand what information architecture is and what areas it covers. The thesis also includes information about whose duty it is to design information architecture and what the benefits of information architecture are.

Keywords information architecture, software development, web design

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HAMK
HÄMEEN AMMATTIKORKEAKOULU

TIIVISTELMÄ

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Systeemityö

Tekijä Turo Nylund **Vuosi** 2012

Työnnimi Informaatioarkkitehtuuri verkkosivujen suunnittelussa

TIIVISTELMÄ

Opinnäytetyön tarkoituksena oli kehittää Spring to Work – nimisen tietojärjestelmän informaatioarkkitehtuuria. Spring to Work – tietojärjestelmä on osa Lähde työelämään – hanketta ja Hämeen ammattikorkeakoulu koordinoi tätä osaprojektia. Työn aihe on valittu kirjoittajan omasta mielenkiinnosta verkkosivustojen suunnittelua kohtaan.

Työn tarkoituksena on selvittää mitä informaatioarkkitehtuuri tarkoittaa ja mitä osa-alueita se käsittää. Näiden lisäksi työssä selvitetään informaatioarkkitehtuurin vaikutusta verkkosivujen suunnitteluun ja toteuttamiseen, sekä minkälaista ammattitaitoa informaatioarkkitehtuurin luominen vaatii.

Teoriataustaksi perehdyttiin pääasiassa kahteen kirjalliseen lähteeseen, joita käytettiin apuna rakentamaan työn runko ja rajaamaan pois aiheeseen kuulumaton asia. Koska kirjoittajalla ei aluksi ollut tietoa mitä informaatioarkkitehtuurilla tarkoitetaan, tutkimusmenetelmä oli vahvasti kvalitatiivinen aiheen osalta.

Opittua teoriaa on sovellettu työssä käsitellyn verkkosovelluksen informaatioarkkitehtuurin parantamiseen. Pelkästään teoria ei riitä informaatioarkkitehtuurin rakentamiseen vaan työssä on käytetty myös aikaisempaa tietämystä verkkosovelluksen kontekstista, sisällöstä ja käyttäjistä. Informaatioarkkitehtuurin kehittäminen oli osa ohjelmistokehitystä ja toteutus tapahtui järjestelmän kehittäjäryhmän keskuudessa.

Työn perusteella on mahdollista ymmärtää mitä informaatioarkkitehtuuri on ja mistä osa-alueista se koostuu. Työn on pohdittu myös sitä, kenelle informaatioarkkitehtuurin suunnitteleminen ja mitä hyötyä siitä on.

Avainsanat Informaatioarkkitehtuuri, ohjelmistokehitys, www-suunnittelu

Sivut 52 s. + liitteet 1s.

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1 INTRODUCTION

Information architecture (IA) has existed a long time and it was represented everywhere. For example, while walking in the city's pedestrian street, you can see organization's logos, ads, news and much more information. At that moment, the oncoming pedestrian is checking his or her emails on the mobile device. That is the moment when physical architecture meets IA. The thesis explores the subject from view of World Wide Web and cover how the IA is applied to websites. This is important because nowadays a number of websites is enormous and the amount of information is growing all the time.

IA is a term that consists of various areas of organizing information. The goal of IA is to shape the information to findable, manageable and useful form. When IA is designed, the concept must be taken into account, because without knowing the areas of the concept, it is hard to create a well-designed IA. Knowing the concept is not enough. There is a need to know how the components of IA influence shaping the information into a useful form.

The web based information system is used an example in practical part of the thesis. The information system is a part of Spring to Work –project which goal is to improve the distribution of international practical training placements as well as the guidance and monitoring of the on-going practical training periods. Spring to Work is a subproject of Lähde työelämään - project funded by the ESF (European Social Fund).

Hämeen ammattikorkeakoulu (HAMK), the University of Applied Sciences, has been responsible for the development of the information system. The thesis focuses on improving existing IA of the information system. At the same time, while working with the subject of the thesis, the information system is further developed. Henceforth, the term 'project' will refer to the Spring to Work - subproject and the information system is called by 'e-system'.

The project time schedule has an effect on working with the subject. Overall there was about four months to do the practical part of the thesis and one extra month to document the created IA. Because of the schedule, three main areas of the IA were included: organizations systems, labeling systems and navigation systems. Two other areas, search systems and controlled vocabularies are overviewed but not at such a detailed level.

The term 'information architecture' is diversified and it takes time to understand the whole idea. The research questions of the thesis include:

1) What is meant by the term information architecture?
2) What kind of fields and components IA include?
3) Why the approach of IA is used in the software developing?
4) Who is meant to design the IA?

Two books are used for the primary source. The first book is "Information Architecture for World Wide Web" by Morville and Rosenfeld. The book includes almost everything related to IA. The book was used to create the main outlines for the thesis. The second book, A Practical Guide to Information Architecture by Spencer presents the IA in different aspect. It includes good tips on how to do things in real life.

2 DEFINING INFORMATION ARCHITECTURE

The term 'information' distinguishes IA from data and knowledge management. Alone, the data is meaningless to people and it is hard to use in a profitable way. It is only numbers, facts and figures. Knowledge is stuff in people's head. People develop tools, processes and incentives to encourage other people to share their knowledge. The information exists somewhere in the middle. (Morville & Rosenfeld 2006, 5.)

There is no single definition for IA but it can be defined by four points. The points are good for those, who are new in a field and Morville and Rosenfeld (2006, 4) uses the following definition in their book:

1) The structural design of shared information environments.
2) The combination of organization, labeling, search and navigation is systems within web sites and intranets.
3) The art and science of shaping information products and experiences to support usability and ease of finding.
4) An emerging discipline and community of practice focused on bringing principles of design and architecture to the digital landscape.

Every day we face up to information about in all shapes and sizes: web sites, documents, software applications, images, etc. With information, we face up to metadata that is used to describe content objects such as documents, processes and more. (Morville & Rosenfeld 2006, 5.)

Structuring, organizing and labeling are what information architects should be done the best. Structure determines the information like the atoms in your site and how those components are related to one another. Grouping components into meaningful categories is called organizing and figuring out how to name those categories, is called labeling. The most critical factor for overall usability is the ease of finding. For good findability, the users use a combination of browsing, searching and asking. If users cannot find what they need, then the website fails. Procedures, clear policies and efficient content management are essential because the user centered design is not enough. (Morville& Rosenfeld 2006, 5.)

The art of IA means experience. We can study different patterns and use that knowledge to improve our web sites, but the practicing of IA will never be reduced to numbers. Because there is too much complexity in bigger web sites, the information architect must sometimes take risks and rely on his or her experience, intuition and creativity. (Morville& Rosenfeld 2006, 5.)

2.1 The history of information architecture

Throughout history, humans have been structuring and organizing information. Libraries are a good example of this. In nowadays, we are becoming familiar with the IA through our experiences with books and libraries. Sometimes IA is hard to apply to the World Wide Web. Table 1 shows how the concepts of IA are applied in the world of print and how it is compared with the World Wide Web. (Morville & Rosenfeld 2006, 5.)

Table 1. Differences between books and websites. (Morville& Rosenfeld 2006, 6).

IA concept	Books	Web sites
Components	Cover, title, author, chapters, sections, pages, page numbers, table of contents, index	Main page, navigation bar, links, content pages, sitemap, site index, search
Dimensions	Two-dimensional pages presented in a linear sequential order	Multidimensional information space with hyper textual navigation
Boundaries	Tangible and finite with a clear beginning and ending	Fairly intangible with fuzzy borders that "bleed" information into other sites

The libraries and librarians are organizing printed material. With structuring and organizing, they are adding the value of printed material by placing them within the framework of IA that suits those materials. In the World Wide Web, the IA shows a similar role and Table 2 describe the differences between libraries and websites.

Table 2. Differences between libraries and web sites. (Morville& Rosenfeld 2006, 6).

IA concept	Libraries	Web sites
Purpose	Provide access to a well-defined collection of formally published content.	Provide access to content, sell products, enable transactions, facilitate collaboration and on and on…
Heterogeneity	Diverse collections with books, magazines, music, software, databases and files.	Huge diversity of media types, document types and file formats.
Centralization	Highly centralized operations, often within one or a few physical library buildings.	Often very decentralized operations, with sub sites maintained independently.

2.2 Related research areas

So far, it is clear that IA includes a wide variety of fields. To identify the areas of IA easier, we can treat the subject from another aspect. The following three fields are not included in IA:

1) Graphic design is not IA
2) Software development is not IA
3) Usability engineering is not IA

Graphic design is responsible for all aspects of visual communication, for example logos and layouts. Software development is much easier to understand and it is rarely confused by people. The biggest difference between IA and software development is that the latter is for implement features, like designed IA. Information architects and software developers should work together because then they can work more effectively and two areas are highly interdependent. Usability engineering is focused on applying accuracies of the scientific method to user research, testing and analysis. (Morville & Rosenfeld 2006, 10.)

If we look more closely at some basic web site, we can notice for example that the navigation bar has labels and links that lead to other sections. Picture 1 shows the top navigation of the HAMK's homepage. In the picture, we can see many kinds of labels and how the information is categorized. If we take a mouse pointer to over the "Students" section, more subcategories will appear and those labels and categories mean something to the user. It may be also applied some techniques in the top navigation bar with hover effects. Categories and labels are areas of information architecture but how they look and feel is not.

Picture 1 Screenshot from top navigation bar of HAMK's homepage. (HAMK 2012)

These, so called "grey areas" is good to figure out and know the basic idea behind them. For recognizing IA, we need to draw some boundaries between these grey areas. Grey areas include the following fields:

1) Interaction design
2) Experience design
3) Enterprise architecture
4) Content management
5) Knowledge management

Interaction design is related to the behavior of tasks and processes that end-user encounter. Interaction is focused on helping user to achieve goals and complete tasks. Experience design is a term that encompasses all the above listed areas and there are not many people who have skills in all those areas, but it is useful to encourage cross-disciplinary collaboration. Enterprise architecture can be mix up with IA but the term 'enterprise architecture' encompasses business, process, information and technology architecture.

Another closely related area with IA is content management. However, IA is more like a snapshot of the information system and the content management is showing how information should flow into, around and out of that same system. People, who are working with content management, are at work with issues of content ownership and technologies to support a dynamic publishing environment. Lastly, knowledge management is purposed to develop tools, policies and encourage people to share what they know, while IA is a way to make that knowledge to accessible. (Morville& Rosenfeld 2006, 9-11.)

2.3 The benefits of information architecture

From client's or organization's point of view, it must know what the return on investment is while design the IA. However, calculating an exact return on investment of the IA is a very difficult task. Related to the book of Morville and Rosenfeld (2006), when designing IA we should concentrate on the following areas:

1) The cost of finding information
2) The cost of not finding information
3) The value of education
4) The cost of construction
5) The cost of maintenance
6) The cost of training
7) The value of brand

The main idea behind of IA is organizing information, so the customer or employee can find what he or she needs. The time spent in finding information must be noticed. For example, how much it costs if your employee spends an extra six minutes every day to finding information on the intranet.

When the right information is not found at the right time, it can lead to bad decisions. These kinds of problems are common. For example, we can think it inform the customer's aspect. The customer who is searching for a specific product on your web site and not finding it, probably changes to another website where he or she can find what is needed.

If we go further and use the same example, the value of educating customers about new products related to their seeking behaviour should be considered. Customers do not always know what they are looking for and

with a well-designed IA you can offer experience to customers and sell products that are pleasing them.

The costs of construction, maintenance and training are areas that can be calculated easier. In the website design these areas are probably noticed but not always in the long run. Building the website can be very expensive, so it is good to invest in future and be sure that the website support findability after being online about six months and scale to your needs. If the website is well designed, it is cheaper to maintain and people who maintain the website, know where to put new content. At last it is good to remember the website users. If the website is intranet, it may be expensive to train the employees to use the current intranet.

Finally, bad IA will affect the value of a brand. This can be a very good point to check how customers are feeling about the websites content and how it is structured. When a lot of money is spent on brand building TV commercials, the websites IA may be insufficient and customers cannot find the order form for the product that they just have seen in TV commercial. (Morville& Rosenfeld 2006, 11-12.)

2.4 Understanding the areas of information architecture

IA is easier to identify, if you know what to look for. The most of areas lives beneath the surface and it is hard to explain how IA is created, so there is a need to visualize it. For the users and clients, it is easier to visualize the areas of IA than just explain what it is because they may not have knowledge to understand how the website has been constructed. The developers, who do not know anything about IA, can update the content of the website without breaking the current IA policies. To IA it is important to know concept, component systems and deliverables of IA.

The Figure 1 shows the concept of IA. The concept is divided into following areas:

1) Complex systems
2) Invisible work
3) Knowledge networks
4) Information seeking behavior

The complex system comprises the knowledge of understanding users, content and context. The invisible work means things that are beneath the interface, for example the used way of structuring information. The knowledge networks mean the interconnections between people and content and explain how these two things can be applied into complex adaptive systems. At last, there is information seeking behavior that helps us understand how people find information. Understanding the concept open the way to communicate with customers and tell them what is IA and where it is made up. The concept of IA is examined in more detailed level on Chapter 4. (Morville& Rosenfeld 2006, 12-13.)

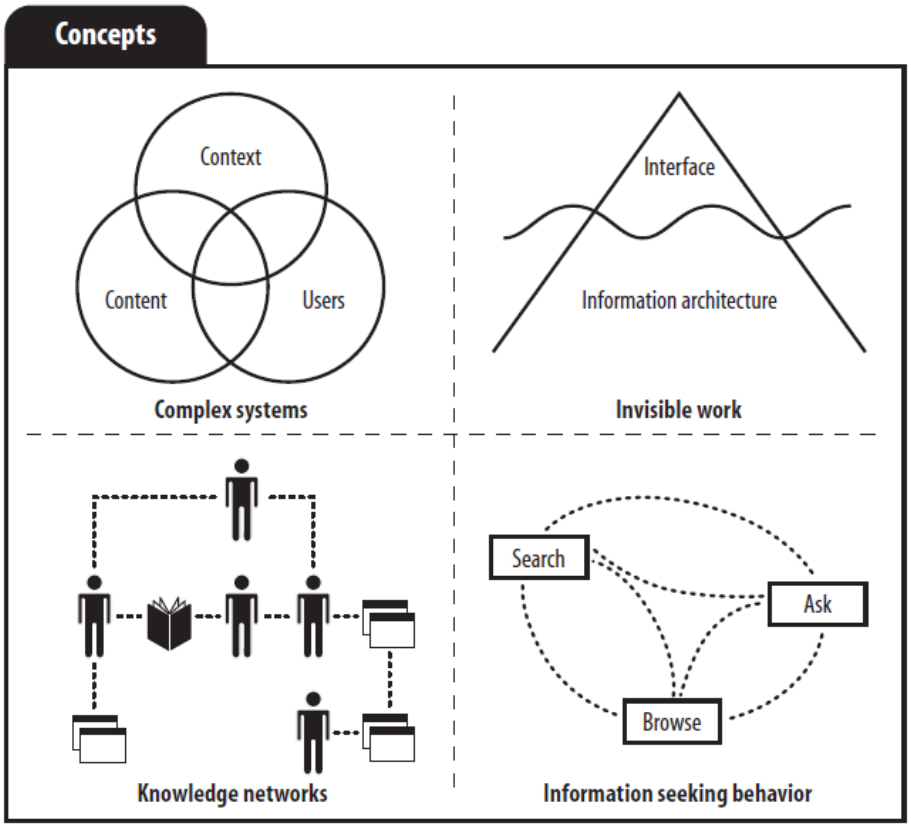


Figure 1. Information architecture concepts. (Morville& Rosenfeld 2006, 13).

After understanding the concept, it is possible to explain the subject more detailed level and define the component of systems that support the web site. Figure 2 shows three systems of the IA: Search systems, navigation systems and semantic networks.

The systems can be split smaller and smaller parts. These components help to understand how searching systems can be applied into the website and realize that an effective search experience is not just a good search engine or a nice interface. Navigation systems and semantic networks together make it possible to create fluid navigation that serves users. The systems will be explaining more detailed level in Chapter 5. (Morville & Rosenfeld 2006, 14.)

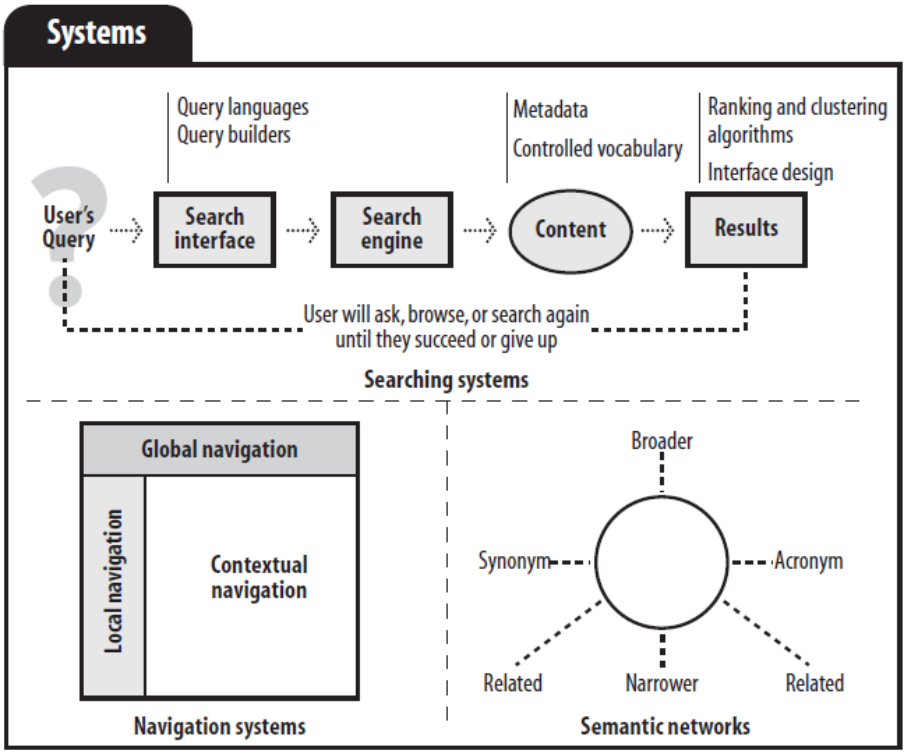


Figure 2. Information architecture systems. (Morville& Rosenfeld 2006, 14).

Finally, Figure 3 shows ways how to document the IA. With wireframes, blueprints, controlled vocabularies and metadata schemas it is possible to render our IA and help people see beneath the surface. There are a lot of more ways to document the IA but above mentioned are simple and easy to understand. More about the deliverables and documenting can be found in Chapter 6. (Morville& Rosenfeld 2006, 14)

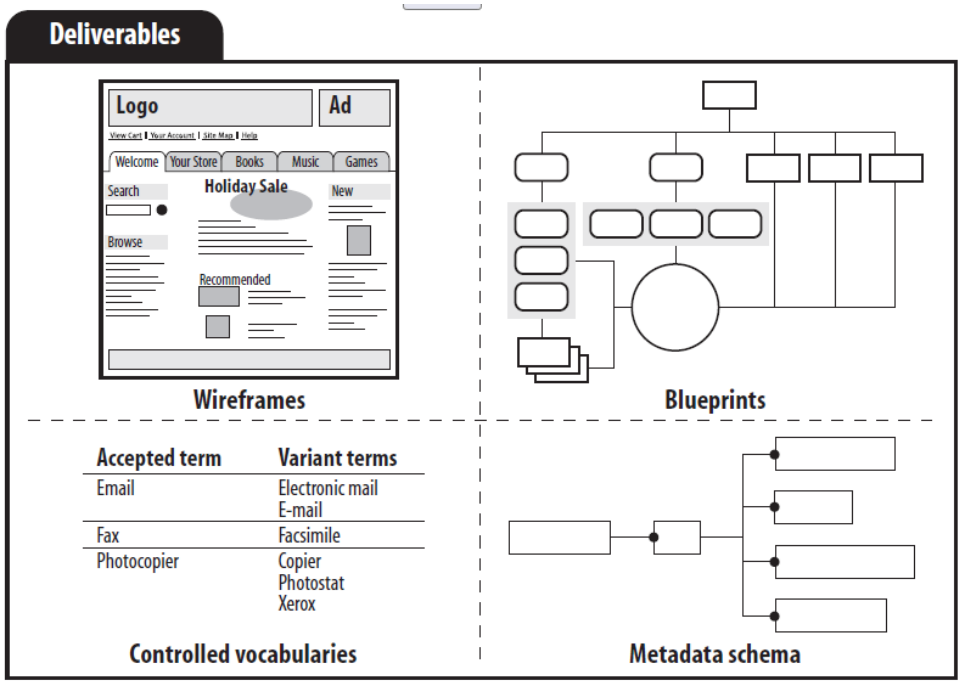


Figure 3. Information architecture deliverables. (Morville& Rosenfeld 2006, 15).

3 CHALLENGES IN THE INFORMATION SYSTEM

The Spring to Work -practical training model is based on the cooperation between home and host university in the organization of the international practicing process. The host university acts as a mediator between the student, his or her home university and the employer abroad as well as a contact point for the student and his or her home university. Spring to Work is a two-way model, so one university can be in both roles. More about the context, content and users of the project is described later. This chapter focuses only to bring out the requirement specifications of the e-system, which should have been noticed while improving IA of the e-system. (Spring to Work -description2012.)

To support this new practical training model, the web-based data system has been developed that helps users' to follow up their practical trainings and share job ads about traineeship placements. The e-system is created on PHP programming language and it includes a few open source tools and services. However, implement technologies are not included IA and that is why the thesis contains only a little information about technologies. Figure 4 tries to explain the basic idea between the Spring to Work -model and the e-system.

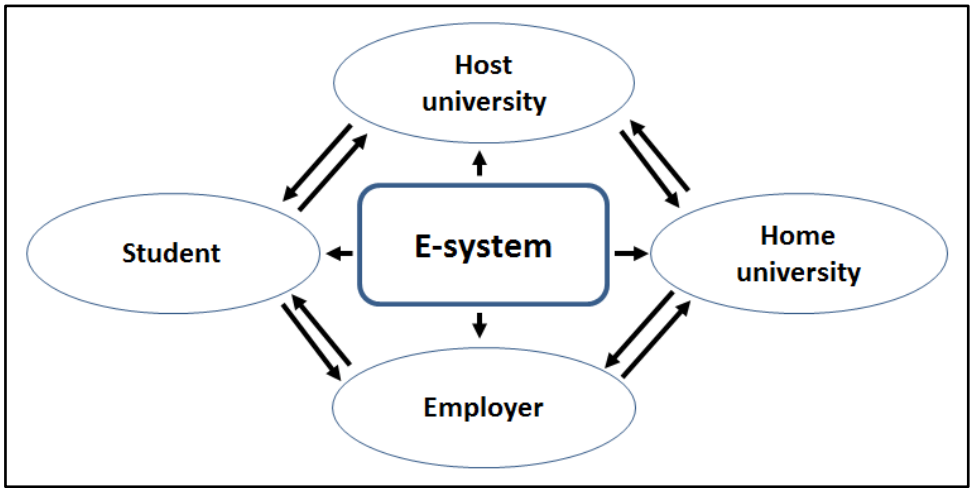


Figure 4 The idea how e-system support the parties of Spring to Work –practical training model. (Spring to Work -description. 2012.)

According to the system requirement specification document that has been made at the very beginning of the project, the project group wanted to an e-system which fulfills the following requirements:

1) User interface of the system must be clear and simple
2) The information must be accessed easily
3) The system must provide right information by roles of the users
4) The system is well-documented
5) The system must provide service a large number of users
6) The system can be installed in private server
7) The system must full basic security criteria
8) The users information cannot be accessed by outsiders
9) The system can be maintain easily and it can be extend later

Requirement specifications are not at detailed level because the project group did not know exactly what they need. They more likely suggested what kind of requirements there should be in the ready system. The project group also listed a bunch of features that should be included in the system. The approach of IA is not giving solution to all of those requirements but the project focused on points 1, 2, 3, 4 and 8. In addition, the other requirements were fulfilled during the project but those are not included in the thesis, because requirements are based on technological solutions.

Of course, it is possible to just test the system repeatedly and concentrate on the usability. At the end, you probably get a good user interface and a well-designed system but in this case there was a possibility to think solution in view of IA. Solving requirements from IA point of view, the content of information is more considered. During planning and creating the IA, context, content and users should be taken into account. With that information the data is shaped into a useful form that serves the users. Every location, structure and labels of the website are justified and planned ahead. After the testing of IA it can be said how good the solutions works and if the chosen was bad, the problem is repaired. The users pose a big role in the design of IA.

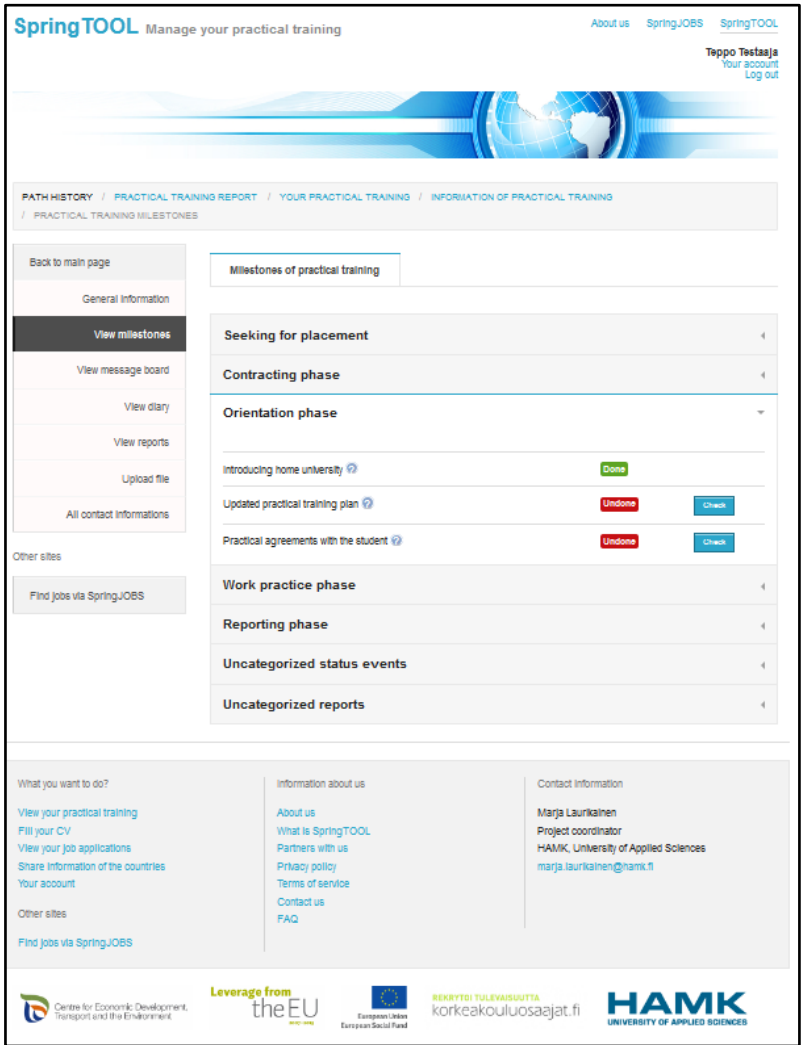
Table 3 presents a need analysis of the users of Spring to Work -model. Overall there are four roles and each of them has specific needs. The decisions of IA are based on those needs and the analysis was excellent material to start planning the IA. There was not so much information about the users of the e-system but it was not a problem of creating IA. Knowledge about the users grows during the project and it gives more alternatives how to implement some of the requirements.

Table 3 Spring to Work -model's needs analysis of users. (Spring to Work - description. 2012.)

Home university	**Host university**
- Information concerning the work placement, its documents and terms abroad - Information about the accommodation, living costs, cultural differences - Student CV's - Reports (e.g. student evaluation) - Work certificates	- Information concerning the student's practical and educational knowledge, strength and weaknesses - Information about the student itself (skills profile of the student) - Objectives for the practicing - Plan for the practice period - Mid-term evaluation - Feedback discussions (evaluation of work placement) - List of available employers - Work certificate for student
Student	**Employer**
- Practicing possibilities available in different countries - Information about the needed	- Information about the student itself (skills profile of the student)

student skills profile - Information concerning the work placement, its documents and terms abroad - Information about the accommodation, living costs, cultural differences - Full contact information of each party - Models for work contracts and other contracts	- Objectives for the practicing - Plan for the practice period - Contact information from Host University (Liaison officers) - Form of traineeship or internship evaluation - Form for letter of reference - Instructions for contribution

More information about the project users, content, goals and components of IA can be found in the later chapters. A great number of examples and images are used to explain what has been done and why. Images are taken from the e-system and the components of IA are explained in small doses. Picture 2 shows one page of the developed e-system and it makes clear how the user interface looks like. The picture is taken from the practical training -module of the e-system.



Picture 2 Screenshot from the developed e-system. The screenshot shows the checked milestones of the practical training period.

4 THE CONCEPT OF INFORMATION ARCHITECTURE

In practice, the IA is related to context, content and users. Three fields help us to know what information architect should understand to design a useful IA. Chapter 4 focuses on these three fields and make clear why the fields are important. Figure 5 explains the same idea and we can notice that there is not any field for technology, because IA is not to take part in technology issues. However, technology cannot be ignored. (Morville& Rosenfeld 2006, 24-25.)

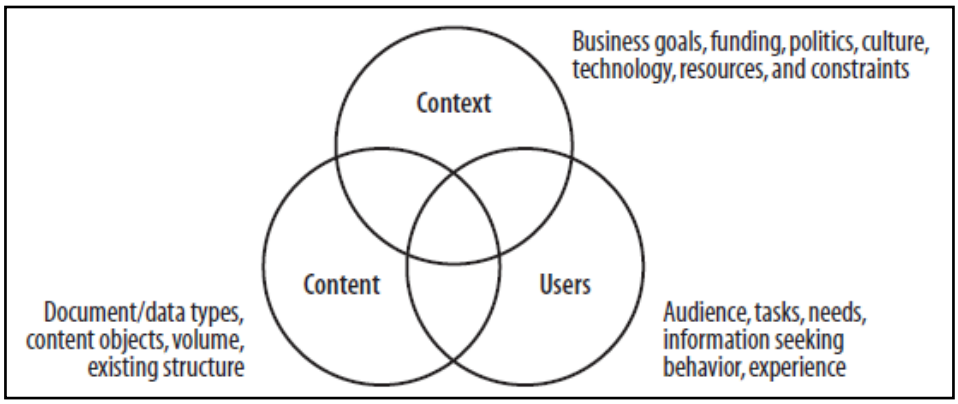


Figure 5 The infamous three circles of information architecture. (Morville & Rosenfeld 2006, 25).

4.1 Context

The term "context" represents business goals, funding, politics, culture, technology, resources and constraints. At technical point of view, the context is related to things that how the information is produced or handled. In the tasks and actions point of view, the context is describing why, when and who is producing or handling the information. (Kaario, K. & Peltola2008, 157)

All websites exist within a certain organizational context. Each organization has a mission, goals, strategy, staff, processes and procedures, physical and technology infrastructure, budget and culture. All of these things are unique to each organization and it is their context. This means that the IA is also unique because it must be a match to organization's context. Find out the context may be a challenging task because all the information is not written on paper. As Morville and Rosenfeld mention in their book, much of this information is in people's head. (Spencer 2010, 37; Morville & Rosenfeld 2006, 26.)

4.1.1 The main parts of the context

While studying the context, you need to figure out the main questions of the context. Related to Spencer's book (2010, 37), the context includes following main areas:

1) Goals
2) Technology
3) Design
4) Culture
5) Stakeholders

It is necessary to know the websites' goals straight away. The goals should be known very closely. If you do not know them, you should not continue before this phase is clear. The goals help to head you where you want to be. For example, goals help to set directions and priorities, make sure you are on track, assess requirements and make decisions. At last, the goals will have an effect on the IA. (Spencer 2010, 37-39.)

After goals, technology poses a big role in the design of IA. However, the IA is not taking part technology issues but it is good to know, what the platform is where the IA is mean to build. Some existing system can be used in organization, like a content management system. It is useful to know, what technologies you can use. You should learn a little bit how the technologies are working or ask someone technical person, if you do not have skills. The IA is unique to every website, so there are not any certain technologies you should look out and learn. (Spencer 2010, 45.)

Existing aspect of design can be faced while designing the IA. You should learn your client's ways before you start to design the IA. Afterwards it is annoying to find out that your design is not fitting the existing website. So pay attention to fit the websites' component and to meet policy requirements. (Spencer 2010, 46.)

Before starting the project, study how the organization's culture is working. This means things like how to communicate to other, can you just talk to whoever you want or not. At last, you need resources to complete the project. Be sure that right people are involved in the project. Avoid things like people who have entirely different perspective on what goals of the project are and the person who not actually has no rights to make decisions in the organization. (Spencer 2010, 47.)

4.1.2 Methods of understanding the client

You have many methods of how to learn the context and figure out the main questions. The first issue is getting to know the overall goals of the project. This key question can be one of the hardest to articulate. Without this answer it is hard to get on goals and solve problems. There can be different types of goals like making more money, reducing costs or helping people make better decisions. For example, we can say that we want to increase sales by 10%. (Spencer 2010, 40.)

The second issue is to know when the project is finished. For goals, you have to determine when those are ready. If you do not have any measured value, you will not be able to use your time and budget effectively. At the end of the project, it is very important to show what the project is improved and show outcomes. Measured variables can be, for example overall visits to the site or product purchases. Despite the fact, your client can give you a set of goals in the best situation. If not, the goals need to be figure out by itself. (Spencer 2010, 40-42.)

Spencer (2010, 42) tells about three methods how to collect information from the client. These methods can be used in many other cases and not only in learning about the context. However, the methods are scenario planning, pain points and "backcasting".

Scenario planning is like a story-telling approach to identify goals. Ask your client to describe their needs in story form. You can use it reversed and ask to describe what a failure looks like. The 'pain points' is a method, where you ask client's to describe what is now going wrong. For these problems, you can set goals and improve them. 'Backcasting' is like forecasting in reverse. In this case, the client describes where they want to be and you work backwards to identify, how you can get there. (Spencer 2010, 42-44.)

4.1.3 Context of the information system

The term "context" is another broad concept and as with content, it takes time to learn a meaning of the context and identify those things during the project. A main source for learning the context was the background material and the meetings with the project group. Of course, to be a part of the project from at the beginning was also a huge help to understanding the content.

Understanding the context has been effected in the created IA in various ways. For example, it has affected the choice of the infrastructure, implementation technology and aspect of interface design. The web service is running on the basic web server and the chosen server is also affected in the choices of implementation technology. The web service is implemented in common web technologies and frameworks. The technologies are also affected in the design of the interface but not so much.

With these implementation choices, various type of the mobile devices is also noticed. The web service is not only working with the web browser of computers, it is also customized to working with the web browser of mobile devices. However, the thesis does not include detail information about the IA of mobile devices, because there are other rules how to build a well-design IA. But it is good to remember that the IA reaches in every area of the daily life and not only in the websites.

4.2 Content

The term 'content' refers to document or data types, content objects and volume and existing structure. It is a broad term but it means things that make up the website. For example, it can include the documents, applications, services, schema and metadata. (Kaario, K. & Peltola 2008, 155)

Before you can start to create the IA, it is good to know what kind of content you have. If you do not know what kind of content you have, you probably come across with problems, because all the needed content is not fit together. However, in a new project you cannot have anything but you should find out what kind of information you may have at the end of the project. While learning the content, there is handled question about information ecology. For example, questions about content ownerships, format, structure, metadata, volume and dynamism must be taken into account. The content is a unique mix for every developed software and must be a remark when design the IA. (Spencer 2010, 123; Morville& Rosenfeld 2006, 27-28.)

4.2.1 Methods of understanding the content

After you have learned all the content you have, it gives you many benefits later in the project. Spencer (2010, 123) says that knowing the content to help you understand the subject, clean up old data, look at your content with fresh eyes, migrating the old content to the new system and manage to content progress during the project. There is not only the one way to learn the content. The chosen method depends on how much content you have. There are three common approaches that you can use: a full inventory, a partial inventory and a content audit. Spencer (2010, 124-125) presents these approaches in her book and gives examples of how they are working in the different size of the projects.

If you are working with a new website, you need try to find out what content you will need. There are a few tips that Spencer (2010, 133-135) tells in her book. The four best start points include:

1) Current behaviors
2) User research
3) Own ideas for the content
4) Competitor analysis

The website statistic analyzing is a good way to learn behaviors (1), if those are available. If not, visit on similar websites and look what is the most popular content. User research (2) can be done in different ways. If you want know how to do that, you should read Spencer's (2010, 64-72) the presentations of popular methods. The same methods are presented later in Section 4.3. The easiest way to create a list of content is brainstorming (3). This is much better if you have a couple of people attending and share their ideas. At last, one way to get known about the content is competitors' analysis (4). Try to find out, what and how well the main competitors provide the content.

If you need to make notes, document or communicating about content with your clients or other people, spreadsheets are a good way to do that. With spreadsheets, you can use diagrams of different kind or sitemaps that shows the relation of the content in the website. The last steps during learning and planning content are to define the content more detailed and priories it for releases. Details from content can include information about a content format, length, audiences and tasks, changes in the content over time and classification scheme. The project is usually divided into smaller phases, so you can include also information about that when the content is created or published during the project. (Spencer 2010, 137-142; Spencer 2010, 143-151.)

4.2.2 Content of the information system

At first it takes time to understand what the term 'content' means. As told earlier, it is a very broad term. While studying the theory about content, it was easier to identify the main content of the e-system.

The web service contains a lot of information that is important to the users. There were told about what information the users will input into e-system and what kind of data it will provide to the users, in the background materials. The document does not include information about types of the data. The formats of the data were chosen during the development process. Of course, the web service is built on another system, so the bottom software has an effected to a format of the data.

Classification schemes and structures are also one important part while creating the IA. These two types of organizing the content can improve or decrease the usability of the web service. Sometimes it was hard to decide what the best way to organize current content is. A few times changes was made to organizing structures because the users' feedbacks point out that there were problems to understanding the current content. Of course, users may have prejudices about that how the content is displayed. For example, the list of students' names is probably more often expected to be in alphabetical order than ordered by a user identification number. More about organization systems can be found in Chapter 5.

There are not so many different types of data in the e-system. Basically, all the data is saved in text based format into a relational database. Also the images that are related to student's curriculum vitae and logos of organizations are transformed in text based format into the database. The e-system also includes possibility to upload files by the users. While creating the IA, the project group decided to use only the most common types of files. For example, the users can upload documents, spreadsheets, Power Points and images, but other types of files have been rejected. The uploaded content is listed in a various place of the e-system for later usage.

Understanding the meaning of the structures and classification schemes and the type of data is not enough. It is necessary to understand the meaning of the metadata. In Section 5.5 is told about more what metadata is.

Metadata helps a lot of to organize and handle the data of the e-system. While collecting the content, it is good to think what kind of metadata a piece of content includes or what kind of information it is possible to add in the piece of the content.

4.3 Users

The term 'users' represent audience, tasks, a need, information seeking behavior and experience. It is relevant to learn users and understand their needs and information seeking behaviors. For example, the organization's manager may need to find a few documents on a specific topic but the organization's researcher may need to find all relevant documents and may spend hours on the hunt. (Morville & Rosenfeld 2006, 28.)

All this knowledge helps to recognize the types of information need and select the right content that the users need. Learning content can be made by asking users directly what they use or look for. This can be made also by looking at existing websites or intranets. In organization, for example, you can ask from staff, what one piece of information they could not live without or look popular pages. Understanding users' needs will helps you to make sure that the existing information meets the key needs, identify information gaps, make the key information easy to find and prioritize content activities.(Spencer 2010, 53-54; Morville & Rosenfeld 2006, 28.)

Knowing a user's needs is not enough. The next steps are to find out what they are doing with the information. They may want to grab a fact, dive in deeper and learn everything about a topic, filter a big set of products and compass items, send it to another people or print it. Before going forward, users may also read all the information, for example in an e-commerce, reading the product description before adding it to their shopping cart. By the same token, where the users use information is important. Information can be viewed in a large monitor and there is plenty of time to read or it can be used in mobile devices. (Spencer 2010, 54.)

When users are looking for information, they may not know anything about the topic or even more than you may be except. Users' needs help you to know their level of knowledge about the current case. Knowing this helps you to describe the content in the right way that the most of the users can use it. A user's knowledge of technology can surprise, because there is people who are not so familiar with technology. Some of them do not even notice that there may be more information out of their immediate view. At last, one of the most important things is learning the terminology that users are using. It represents their language and knowing this, for example, can be useful when there is a need to creating an A-Z list or develop a search engine. (Spencer 2010, 55-57.)

4.3.1 Researching the users

Before you can start the process of learning about the users, make some kind plan that tells you, what you want to learn. If you do not plan your user research, then there will be at risk that you run around in circles and will not figure out exactly what you want to learn. To do this, you have to ask right question from your client. When you ask a question, you should want to know how users are feeling and what piece of information is missing. There is no need to ask popular pages from users, if you can use some kind web analytics tools. (Spencer 2010, 57-58)

Spencer (2010, 58) explain one of her methods where she uses '5 Whys' game in her example. '5 Whys' is a question-asking technique used to explore the cause-and-effect relationships underlying a particular problem. (Olivier Serrat 2009)

All the IA projects should include user research but the size of research is every time different. You cannot always start an extensive research, so plan the need of research in advance. When you are making this decision, you can ask yourself questions and see how much you already know about your client or audience. Spencer (2010, 59) lists some question, how she makes decision for the size of user research:

- How much do you already know about your audience?
- What are the consequences, if something goes wrong?
- How much money is involved?
- How quickly do you get feedback?

If you are design the IA for personal blog, user research can be a very simple process but design the IA for enterprise, the in-depth user research would be a good idea. (Spencer 2010, 59-60.)

Research the right people is also very important. When you start your user research, be sure that you involve right people to the project. If you need to create the IA to company's customers, then do not talk only to the managers. The most important audience in this case is customers, not only the managers. When you know who to research, you can use methods to involve them. For example, you can use formal recruiting, informal recruiting or online recruiting. In team working, do not forget your teammates. Use them in the research when needed. Those, who are making design decision in the project, are a good people to involve. (Spencer 2010, 61-63.)

4.3.2 Methods of understanding the users

Collecting new information can be made a various way. Spencer (2010, 65) talks about four types of methods. Direct collection involves some type face-to-face activity with the participant. Indirect collection is made without any face-to-face contact. Self-reported methods rely on the participants. Observe methods involve seeing how participants actually do something. Spencer (2010) is talking a lot of about how to research users and Figure 6 will summary these methods very well. I recommend reading

Spencer's book about user research because it describes the basics how to do user researching.

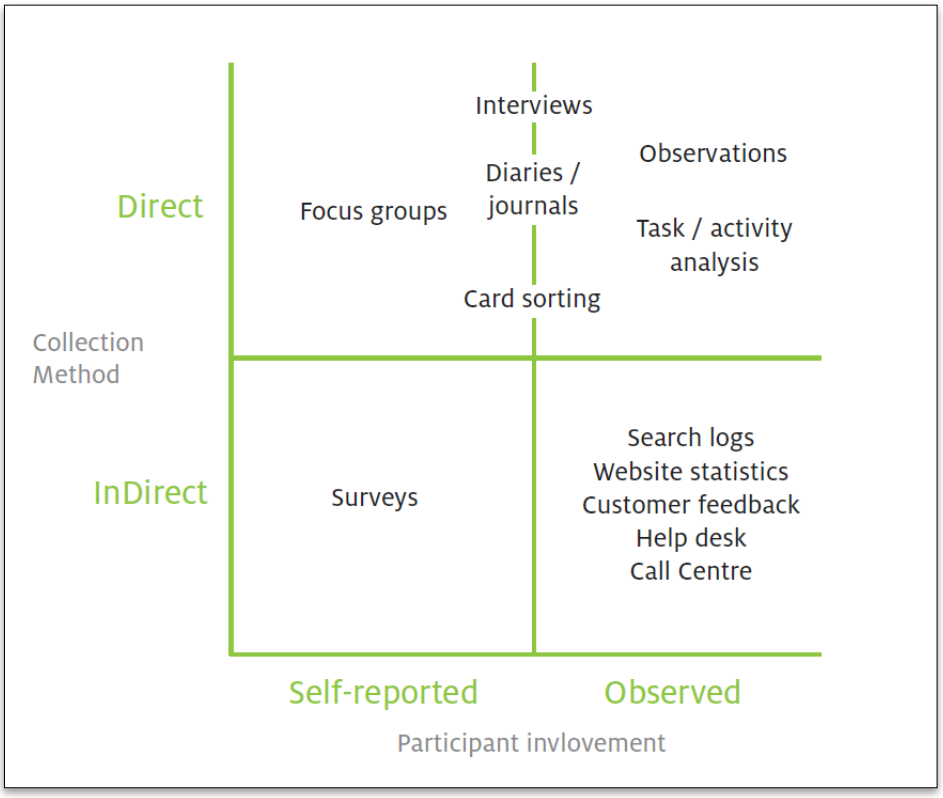


Figure 6 Researching and data collecting methods depending on to the type of involvement (Spencer 2010, 64.)

4.3.3 User needs and behaviors

The IA starts with users. The users have an information need that needs to be satisfied. There are different behaviors concerning how they are seeking information. It depends on the website, what kind of seeking behavior the site will support. If the website is a customer directory, the most common information needed can probably be gained from looking up a customer's phone number. Still, there is not only one way to find this piece of information. One user find that information using A-Z list directory but the second one want to use search box to find out the same piece of information. Every user has behaviors of different kind. (Morville & Rosenfeld 2006, 30.)

For example, the most common information model is called "too-simple". It consists of four steps. First the users ask a question. After that the system does something that the user cannot see, for example run a search algorithm. Then the user receives the answer and gets the right answer or not. However, this model has its own problems and that is why it is not the best choice. When designing the IA, the information architect must think what kind of information the users want? How much is enough? How do the users actually interact with the architecture? To build better models,

we have to learn about information needs and seeking behaviors. (Morville& Rosenfeld 2006, 31-32.)

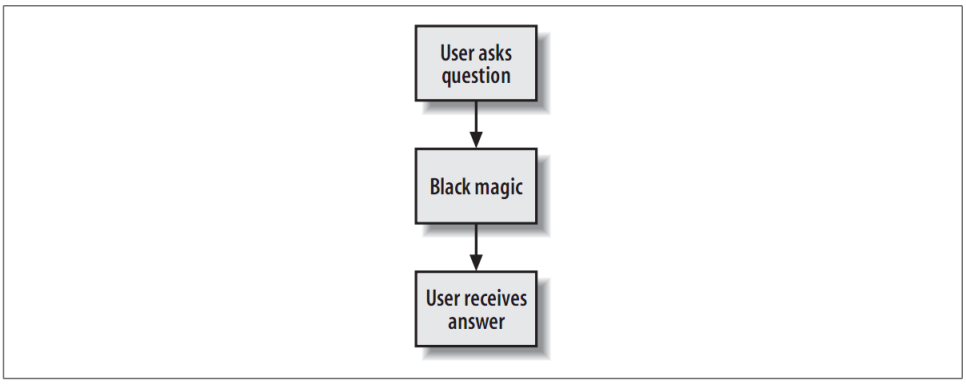


Figure 7 The ”too-simple” model of information needs (Morville& Rosenfeld 2006, 31).

The information needs can be divided into four main groups:

1) Known-item seeking
2) Exploratory seeking
3) Exhaustive research
4) Re-finding

The known-item (2) seeking is like a “too-simple” model. The user’s know what he or she is looking and want the one and only answer. When the user does not know everything about the topic what they are looking up, they want try to find out similar topics. (2) This is called exploratory seeking. In this case the “too-simple” model is not working anymore and we need a complicated system. The exhaustive research (3) represented the situation where the users want to know everything from the topic. These kinds of information needs can be common when doing research from the specific topic. Re-finding (4) mean using the old items again. This is the situation where the users want to save their item and re-enter it later. The bookmark tools are useful in this case. (Morville& Rosenfeld 2006, 33-34.)

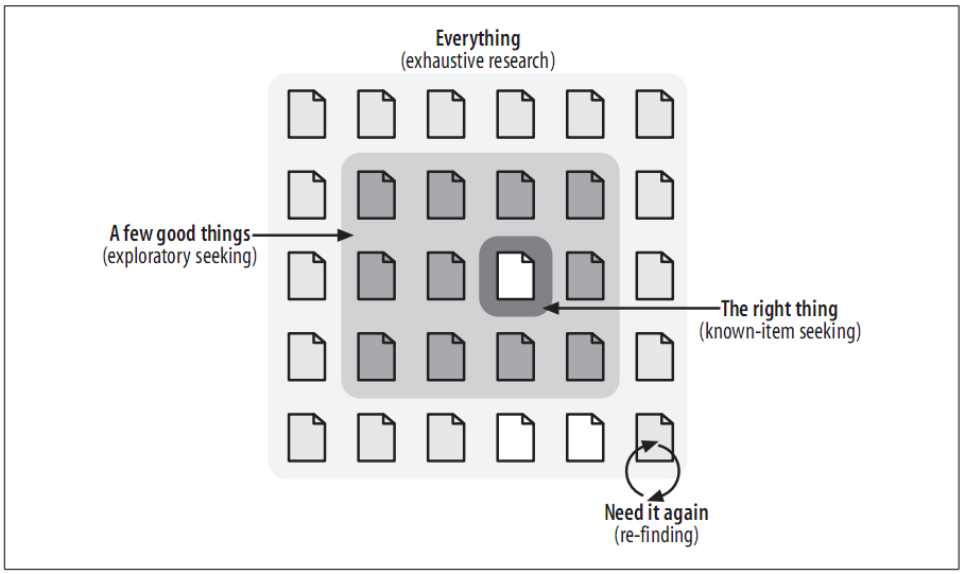


Figure 8 Four common information needs (Morville& Rosenfeld 2006, 35).

Information seeking behaviors can be divided into three main groups: Searching, browsing and asking. All these three ways are common when the user is looking up something. The user can enter a query to a search engine or browse around in the website via navigation. At last, the users can also ask something from another person.

All the three ways can be integrated together or the seeking behavior is iterated. Iteration means that the information need is changing along the process. This is called "berry-picking" model. This model is close to our normal way to look up information. First we have an idea what we are searching and make information request. When we get an answer to our first need, we change our information request a little bit and get the second answer. This is repeated over and over until we get the right answer or quit searching. (Morville& Rosenfeld 2006, 35-37.)

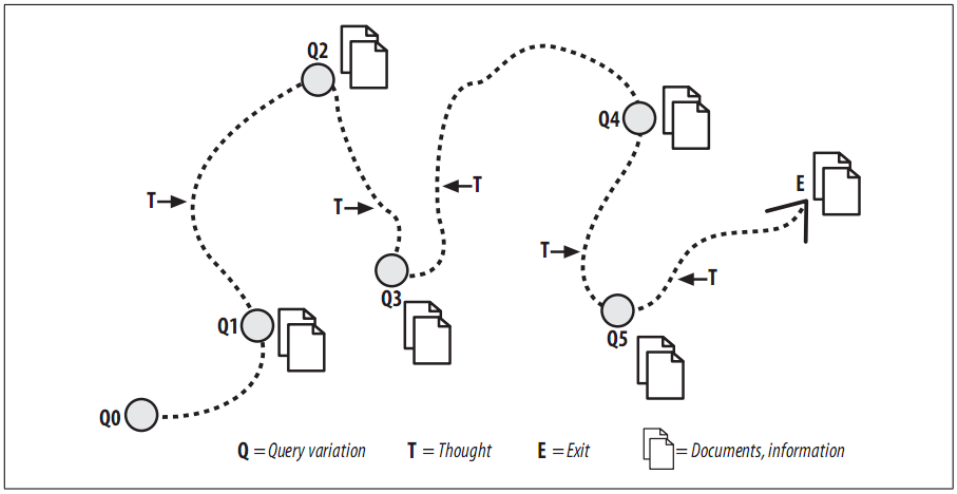


Figure 9 The "berry-picking" model of how users move through an information system (Morville& Rosenfeld 2006, 36).

4.3.4 Users of the information system

Studying users was one of the hardest parts while creating the IA. You cannot forget your users because they play a big role when the service will be published. During the project, there was no time to arrange huge research around users of the web service. Of course, the research for the thesis was done in summer, when most of the people are on vacation. The e-system includes three types of users: students, the staff of universities and employers. However, this should not be a barrier when developing software and the IA.

The project group has made simple user profiles and the profiles were one of the main sources when learning about the users. There was also time to discuss with staff members of HAMK, who are one of the three user groups.

While researching the IA, it gives new perspectives how users look for the information. Users' behavior is not a simple thing and understanding it better, you should take on courses about human behavior. Nevertheless, understanding the basics is enough for creating the IA. The book of Information Architecture for World Wide Web by Morville and Rosenfeld will teach you the basics about users and their behaviors. The thesis include only a piece of that information but it is enough to understand what must be taken into account while creating the IA. I recommend reading the book.

The project includes a lot of meetings with staff members of HAMK. The meetings were meant to view the milestones of the project but notes were also taken by developing group during these meetings. Without knowing, I was the spectator and wrote up given feedback when the project group tests the e-system. There were also a lot of private sessions to understand the background of the project. The sessions were also a good information source in view of the IA. All of those notes and meeting minutes were saved into the project management system where they are available for later use.

With students and employers, there were no meetings, so understanding these users was a little bit harder. Meetings should be included while developing the IA, if possible. During the meetings, you get a lot more information than you can imagine. The lack of meetings was solved by standing as students' or employers' place. With the background information and envision to be someone else, is a good way to develop the IA but it does not response the final needs. This kind of working also requires good imagination but you do not need to do it yourself. You can utilize the other people in your team and spend time together and think what the end users want. Also the meetings will not be the perfect choice, if you think that the people will give you all the answers. You need to prepare those meetings well and ask questions from the attendees and that way you can get the answers you need.

Well-designed IA is made for the users. In nowadays users are noticed more and more in a development process to design user-friendly services and these doctrines can be applied to other fields too. All the theory about users and their needs was adapted while creating IA of the e -system. The final version of the created IA is described in Chapter 5. The chapter includes how the users' backgrounds and information needs are noticed in the e-system’s user interface and structures.

5 THE ANATOMY OF INFORMATION ARCHITECTURE

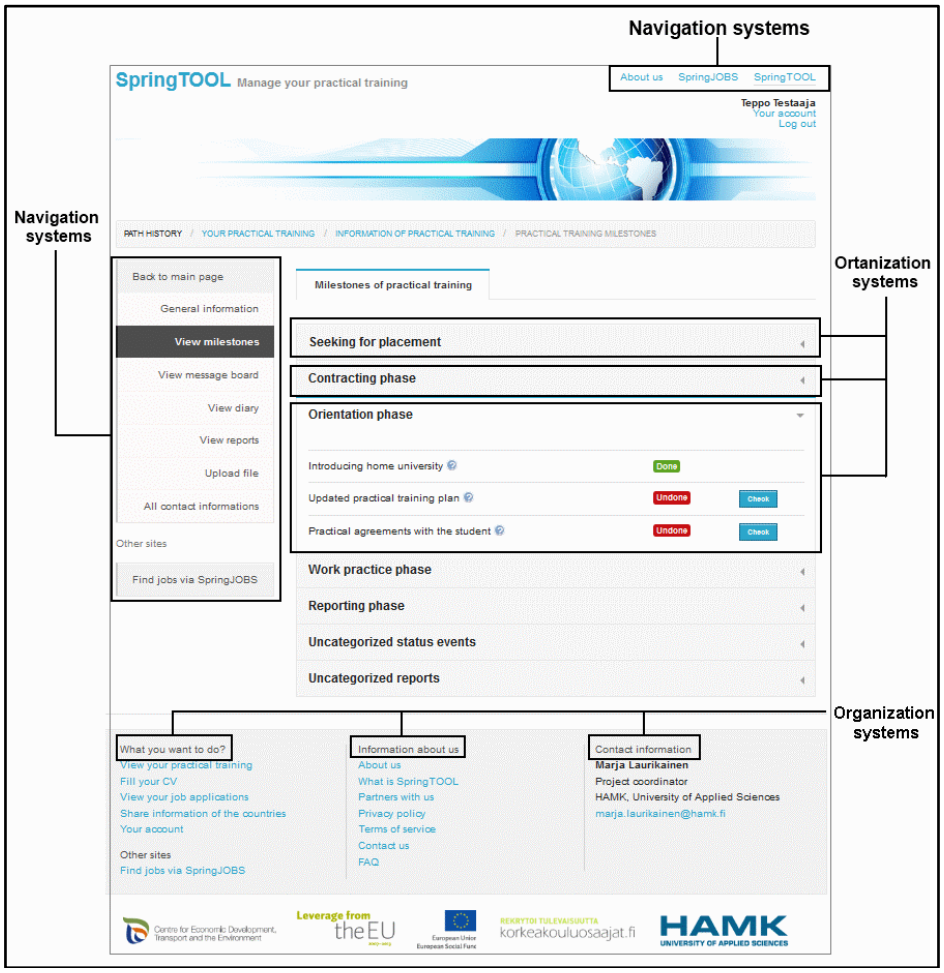
Visualizing the IA is important when there is a need for describe it to other people. However, well-designed IA is invisible to users. Most immediately when users land on the website, he or she sees the visual design of the pages. For example, the colors, the number of columns, images, a font types, use of mouse overs and pull-down menus. These elements are not areas of the IA.

5.1 Defining the components of information architecture

If you know what to look, the IA steps out from behind of the website lay-out. The IA can be breaking up into the following components:

1) Organization systems
2) Labeling systems
3) Navigation systems
4) Search systems

The components are marked in the Picture 3 for demonstrating the anatomy of IA. The picture is the same as in Chapter 3. (Morville& Rosenfeld 2006, 41-44).



Picture 3 The e-system's page crammed with architectural components.

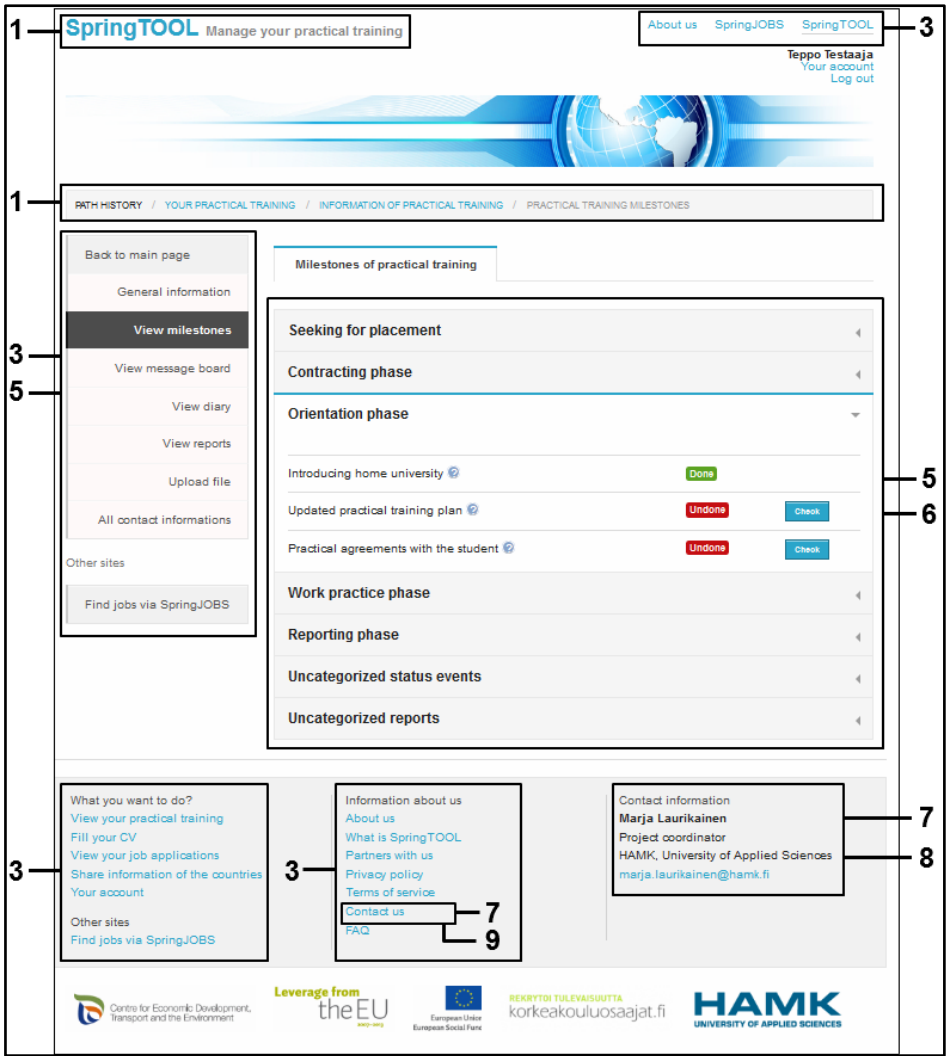
Organization systems present the information in various ways, such the content categories. Navigation systems allow users to move through the content. Because the e-system does not contain a website-wide search box or category based filters, search systems are not marked in the picture. However, a search system allows users for search the content. Because labeling systems describe categories, options and links in language of the users, any specific section is not marked for the labeling systems. One screenshot includes a lot of information and all the IA structures are hard to mark in one picture. Four components are described better in later. (Morville & Rosenfeld 2006, 43).

5.1.1 Major information needs

The website's IA tries to answer user's information needs. Learning the users and their needs, we can design the main page that satisfies the user. This is called "top-down" IA. Related to Morville and Rosenfeld (2006, 43-44), the common questions when the users land on a page of the website, may include:

1) Where am I?
2) I know what I'm looking for; how do I search for it?
3) How do I get around this site?
4) What's important and unique about this organization?
5) What's available on this site?
6) What's happening there?
7) Do they want my opinion about their site?
8) How can I contact a human?
9) What's their address?

These basic questions work fine when designing the structure of the website. The same questions have been used to create IA of the e-system for satisfying the users' information needs throughout the e-system. The Picture 4 demonstrates how these questions can be seen in the created IA. As you can see, there are not all the questions marked, because the architecture of web service is somewhat different in each page. The users' information needs are also noticed in the IA but those are not marked in the following picture.



Picture 4 The e-system's page is crammed with answers to basic questions

There is also a "bottom-up" IA which is typical when the users arrive at the page via search engine. For example, the users may use Google's search engine to find a suitable website for his or her question. When the users click the website's link, he or she is not always to land the main page, and the user can see only a piece of information. He or she likely bypass the website's top-down IA. The common question in this case may include:

1) Where am I?
2) What's here?
3) Where can I go from here?

The well-designed IA takes care there both scenarios. (Morville& Rosenfeld 2006, 44-48).

5.1.2 Alternative way to categorize the components

It is hard to know exactly the best method of categorizing the areas of IA and the above mentioned four categories are not the only way. However, in the thesis, the IA is based on the mentioned categories. The organization systems tell us how we categorize information. Every categorization scheme has its own problems so there is also an alternative method of categorizing the components of IA. The alternative methods also include four main categories: Browsing and search aids, content and tasks and invisible components. (Morville& Rosenfeld 2006, 49-50).

The browsing aids are a predetermined set of paths to help them navigate the site and include organization systems, site-wide and local navigation systems, table of contents, site indices, site guides, site wizard and contextual navigation systems.

The search aids allow the user to make a query and navigate within the site. These aids components are mostly dynamic and include a search interface, query language, query builders, retrieval algorithms, search zones and search results.

The content and tasks are the users' destination and include headings, embedded links, embedded metadata, chunks, lists, sequential aids, identifies.

The invisible components are completely in the background and these components may feed the others aids components. The invisible components include controlled vocabularies and thesauri, retrieval algorithms and best bets. (Morville& Rosenfeld 2006, 49-52).

5.2 Organization Systems

The IA aims at organize information by design organization and labeling systems that make sense to users. The Internet provides flexible environment to apply multiple organize systems but anyway many large websites have difficult navigation. This is a problem where organization systems try to answer. The major challenge of organizing information is the amount and growth of information in each day. (Morville& Rosenfeld 2006, 53-54).

Classification systems are based on language and language is ambiguous. One word can be interpreted more than one way. Morville and Rosenfeld (2006, 55) give an example. The English word "pitch" has more than 15 definitions, including: a throw, fling, a salesman's persuasive line of talk or an element of sound determined by the frequency of vibration. This ambiguity must be observed, because we do not want that users will miss our meaning.

The websites can contain different kind of information in different formats. Articles, videos and images can be shared same time in the websites and this heterogeneous of websites makes it difficult to use a single organ-

ization system on the content. Each format should not be handled in the same way. When organizing information, you come along questions like:

- How people do organize their information?
- What labels do they use?
- How do they navigate?

For example, differences in people perspectives are clearly seen in everyday life. If you try to find a single file on your friend's computer, it may take hours to understand how your friend organizes his or her information. (Morville& Rosenfeld 2006, 55-56).

A major factor success in a well-design IA is the organization of information. There are a few different schemes and structures that can be apply to websites and intranets. Organization systems can be divided into organization schemes and organization structures. Schemes are used to create the logical grouping of items and structure defines the relationships between the items and group. (Morville& Rosenfeld 2006, 55-56).

5.2.1 Organization schemes

We encounter organization schemes everyday life. For example, telephone books and television programming guides use organization schemes to ease access. The schemes can be split into two major types: exact and ambiguous organization schemes.

Exact schemes divide information into well-defined sections. For example, the telephone book uses alphabetical list and you know that "Virtanen" is in the V section, just after the U section. Ambiguous schemes divide information into categories that defy exact definition. Ambiguous schemes are more difficult to maintain but they are more important and useful than exact schemes. Exact schemes are used more in known-item searching because they support logical grouping but ambiguous schemes support exploratory searching and associative learning. (Morville& Rosenfeld 2006, 59-62).

The exact schemes include classification by alphabetical, chronological and geographical. The ambiguous schemes include classification by topics, tasks, audiences and metaphors. However, the power of organization scheme comes up when mixing these schemes with large amounts of content and this classification can be called hybrids. (Morville& Rosenfeld 2006, 59-68).

5.2.2 Organization structures

The organization structures are like glue between the pieces of information. The structures define way how users can navigate through the website or intranet. Most of the cases, organization structures are not used alone. Structures works better when those are combined together. The four main types of organization structures include:

1) Hierarchy
2) Database-oriented model
3) Hypertext
4) Collaborate categorization

Each of these structures has strengths and weaknesses, so you have to make the right choice when design the IA. (Morville & Rosenfeld 2006, 69).

A hierarchy (1) is one of the easiest ways to organizing information. This "Top-down" approach is simple and familiar to start creating the IA. Figure 10 shows the examples of hierarchical models. This kind of design can be also called taxonomy. When design taxonomy, you must spend time for selecting the good labels of categories. There are many ways to categorize items and the meaning of sentences is not clear to all users. The second thing that you have to notice is the depth and breadth of the hierarchy. Your taxonomy can be narrow and deep or broad and shallow. (Morville & Rosenfeld 2006, 69-72).

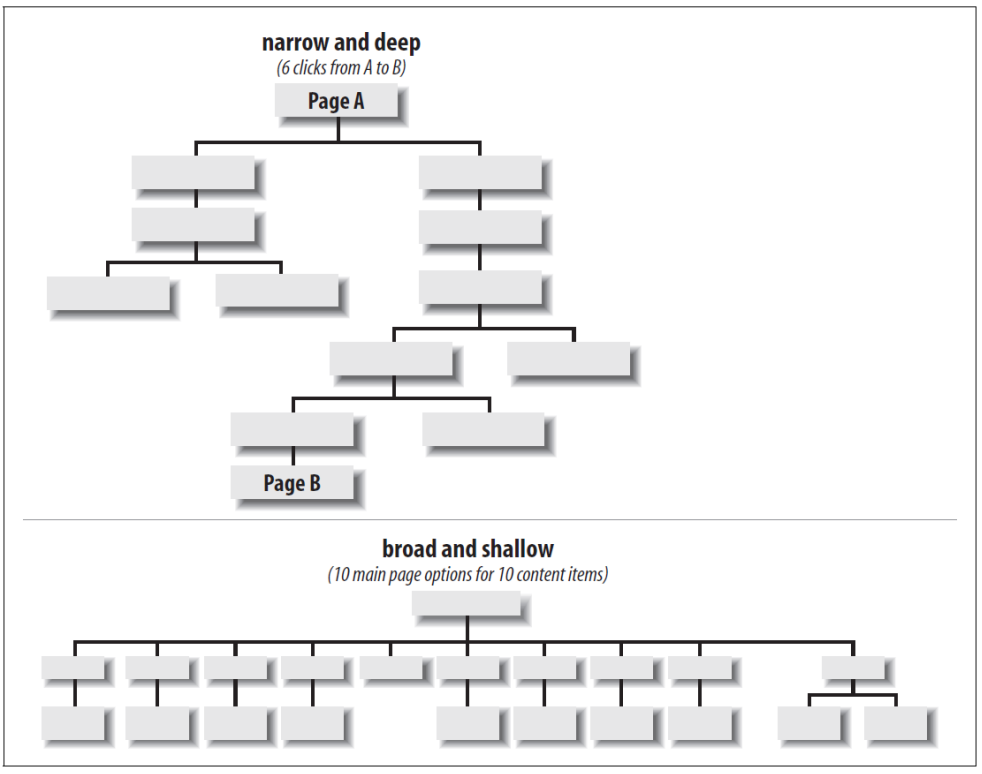


Figure 10 Examples of hierarchy types (Morville& Rosenfeld 2006, 71).

Opposite to the hierarchy is the database model (2), which structures the information from bottom to up. This is called also "Bottom-Up" approach. Most software uses some kind of database and we want to present this data to our users. The IA focuses more on information access than data retrieval but as an information architect, we are interested in from the metadata of databases. This metadata links database schemas and the IA together. Metadata allows us to add information into data and building powerful search engines. (Morville& Rosenfeld 2006, 73-74).

Because working with the databases could be hard and queries may be complex, the information architect does not have a need to be professional in SQL (Structured Query Language) or another database query languages. Morville and Rosenfeld (2006, 74-75) say that the information architects needs to understand what you can do with these technologies. With metadata, controlled vocabularies and database structures you can build features like: product index, a dynamic presentation of associative “see also" links, fielded searching and advanced filtering or sorting of search results.

Hypertext (3) is the non-linear way to connect pieces of information together and it does not have any trunk. For user it may be confusing and rarely the hypertext is used for the main navigation. This organization structure can be used supplemental navigation when you have first created the hierarchy to your website. Figure 11 demonstrates how the hypertext connections work. (Morville & Rosenfeld 2006, 77).

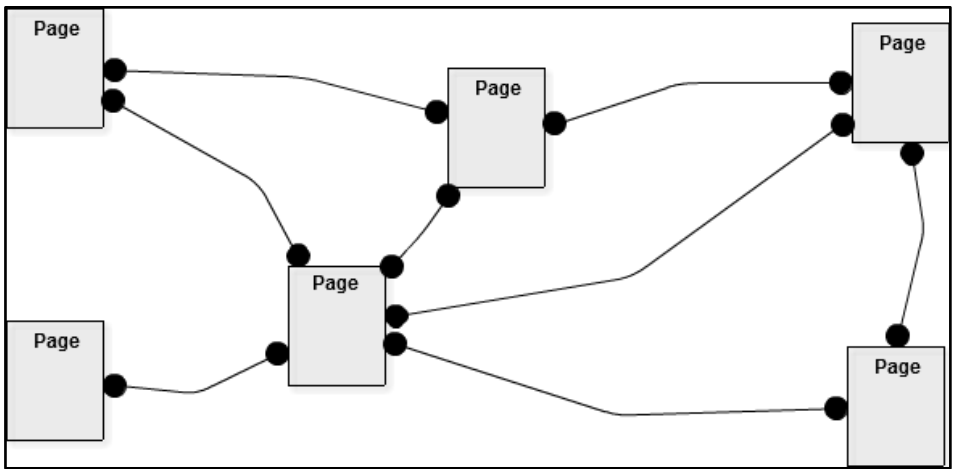


Figure 11 Demonstration of the hypertext connections between the website’s pages. (Morville & Rosenfeld 2006, 77)

During the past few years, the social networks have had to get more and more popular. This has pointed out a new way to organize information by tagging it (4). There are services like Flick or Delicious where the users themselves can bookmark information. After that the organized information is available to other users in the same service. When using bookmark services of this kind, it can be seen how people organize their contents and what kind of labels they use in everyday life. (Morville & Rosenfeld 2006, 77-79).

5.2.3 Organization systems of the information system

Creating the e-system’s IA was started to design the organization system for the service. Shortly, it was clear that the e-system was impossible to base on one structure only. The amount of information and different user roles was caused problems because all roles were needed personal user interfaces. Overall there were four different types of user interface for all users, including the user interface for the administrator.

Hierarchy based structure was the easiest point to start creating the IA. First, all the functionalities were categorized by users' information needs. With this information it was possible to create first version of IA, which is based in user roles and the hierarchy model. The database oriented model would have been given better IA but lack of the knowledge about database's structures was prevented this. All the users' information needs was clear but the database's technical solution was not supported the information needs a very well. At the project, too little time to create functional database was spent. With this ground, the hierarchy was offer better results at the phase of the project.

Figure 12 demonstrates the variety of the hierarchies and sub-sites. Every user role of the e-system has a personal hierarchy, as it can be seen. The figure does not include detail information about the sub-sites, because all the sitemaps is hard to get fit in one figure. More about how the sub-site's information is presented by sitemaps is told later. The figure only shows the sub-sites of the user roles but there are similar figures from other parts of the e-system. Other parts include the job board in sharing traineeship placements, a marketing page for the e-system and practical training module for following the progression of the student's traineeship period.

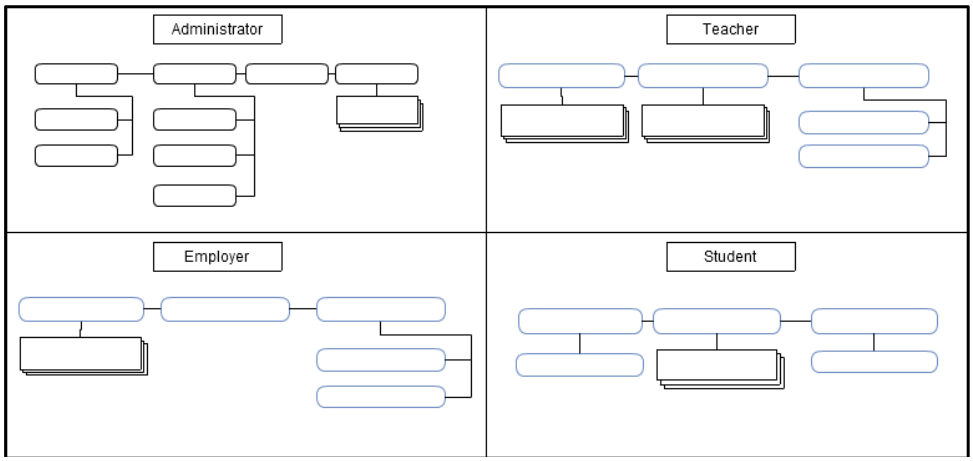


Figure 12 Example from the sub-sites of the e-system.

The abstract models of sub-sites are not enough for an information architect. The next step is to go more detailed level and for that, detailed sitemaps were created for every sub-site. There are no any official standards how the sitemaps should be created and it takes to time get planning details of the sitemap. Differences between basic sitemap and sitemap of the IA are provided more information about the content of pages. Figure 13 below explain this idea better.

The sitemap include information about the structure and what information every page contains. For example, if we look at page called "View your practical training", there can be seen that the page includes information about the history of student's traineeships and other information about traineeships. The white boxes describe what information is included in each page. The white boxes can also include information about what clas-

sification is used. The grey boxes contain the name of the pages. There are also green boxes in the right top corner and those boxes represent links between different sub sites. Below “Fill your cv” page, there is a yellow box. It means that another sitemap have been made about the content of the page. Following these policies, all the sitemaps were done in the same guide and later the sitemaps can be used to improve existing IA. Spencer (2010) presents a bunch of structures in the useful table for getting more information, I recommend reading Spencer’s book about IA.

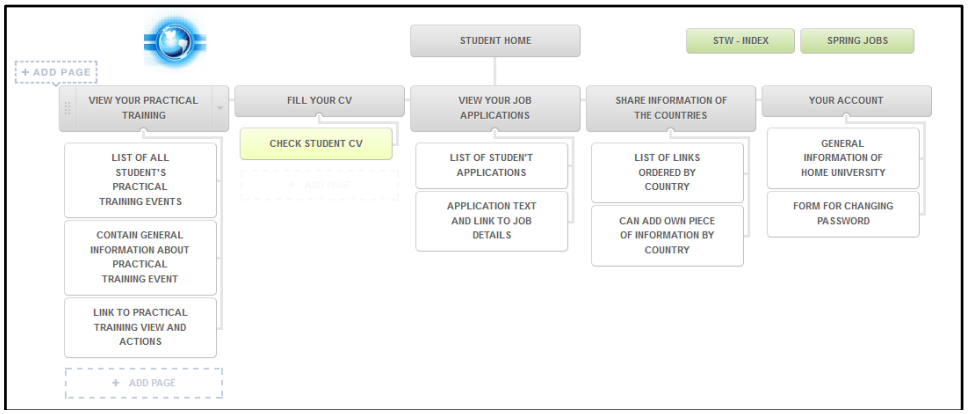
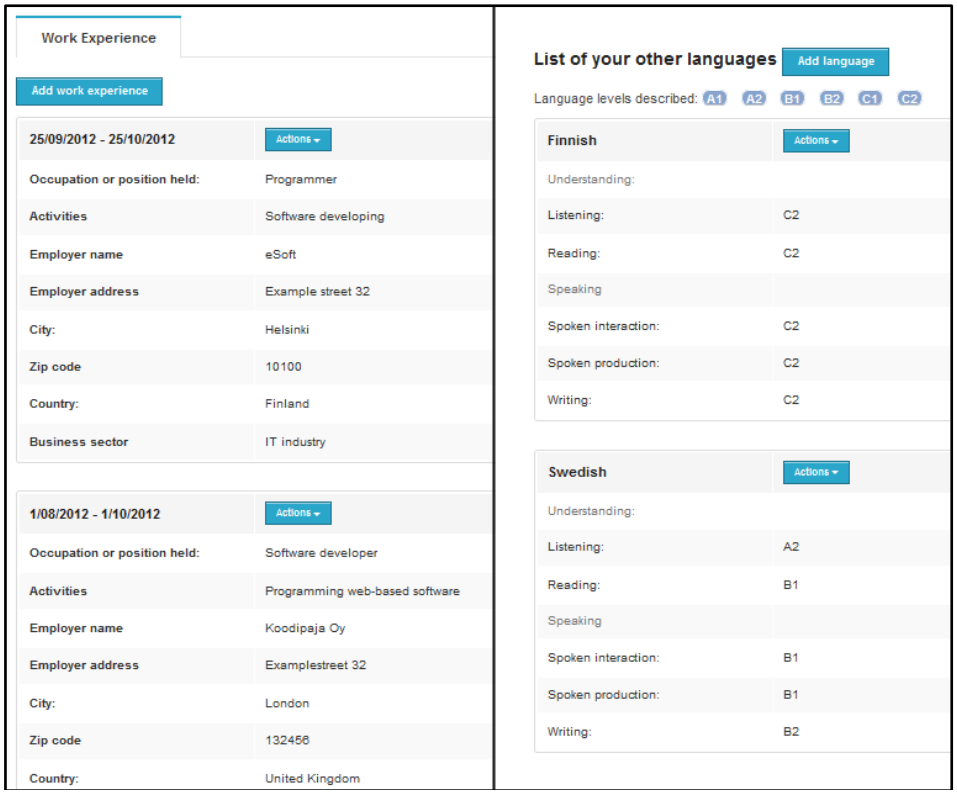


Figure 13 The more detailed version of the sub-site’s IA sitemap.

After the hierarchies were ready and prototypes of the user interface were working, hypertext structures was started planning. Hypertext connections make the e-system work more flexible and the available information can be to get accessed much easier. The connections are not documented in the sitemaps, because there are a great number of links between the pages. If we add all those connections to the sitemaps, the connections will make it harder to understand and confusing. If you want, the hypertext connections can easily add into spreadsheet for later use. In the project, we design site-wide policies how the hypertext connections are handled. The policy information is included in system specification document that includes guides for managing IA.

The organization structures are made for grouping the content in logical groups. With structures, various classification schemes in the e-system were used. Most of the cases information is based alphabetical or chronological classification schemes. Selecting the right classification for each situation was hard because of the user roles. For example, if student see his or her history of traineeship placements in chronological order, the same classification scheme may not suite to employers. For employers, the same information is provided in different classification scheme.

The **Virhe. Viitteen lähdettä ei löytynyt.** present way, how two different lassification schemes are used in the e-system. On the left side of the figure, work histories are ordered in chronological order by end dates and other scheme is used to list language skills by alphabetical order.



Picture 5 Examples of used classification schemes in student's CV.

During the project, web based tools were used for visualizing hierarchies and classification schemes. Cacoo (Cacoo 2012) and Slickplan (Slickplan 2012) are tools for creating diagrams. The tools ease the creation process of the IA and help solve problems with visual aspect. All the created diagrams are good material for other project members also, who do not have knowledge about IA. It is possible to use paper and a pen to do all the same thing. The problem with chosen tools is always the same: how to manage the documentation and keep them up to date? Updating the diagrams and documentation takes time and the developers itself chose the best way to do that. For a good tip to other developers, the deliverables of project phases are always snapshots from current situation. In the project, developers decide to do all the documentation at the end of the project and it turned out a good choice.

5.3 Labeling Systems

Labels represent our language, how we describe things and how we understand words. In the well-designed IA labels are very important, because with the bad choices of words may be confusing to end users. Earlier we have noticed that one word can mean a different thing in the different situation. Design the IA is trying to prevent this and in the website we want to speak the same language as our users.

The choices of labels can be particularly seen in the website's navigation. Trying to get sense how successful the labels are, Morville and Rosenfeld (2006, 82-83) suggest to ask itself questions like:

- Do the prominent labels on this page stand out to you? If not, why?
- If labels are confusing, is there an explanation?
- Is there need to click through to learn more?

5.3.1 Varieties of labels

The one label can do more than one thing from just listed functions. The contextual link "Products & Services" could lead to a page that uses the heading label "Products & Services". Morville and Rosenfeld (2006, 86) says that the labels can be used as following circumstance:

1) Contextual links
2) Headings
3) Navigation systems
4) Index terms

As contextual links, the labels describe what kind of information the hypertext link contains. Contextual links are also related to their surrounding text. The links are easy to create and almost all of the websites include some hypertext links. When designing the contextual link, you must understand that they represent their creator language, choices between sentences and they are not automatically generated by the system. (Morville & Rosenfeld 2006, 87).

When labels are used as headings, they are related to the block of information that follows. Headings often have hierarchical structure in the text because then they are easier to distinguish and alone the headings are hard to understand. However, if we used visual elements to separate them from paragraphs and create the hierarchy with bullets, they are more comprehensible. (Morville& Rosenfeld 2006, 90-91).

In the website's navigation panel, there is not so much space to use long labels that clearly describe the content. When using labels as navigation, it is good to spend time and think how to design them. Typically, the navigation systems have a small number of options, so there cannot be too much things. If you think that the labels of navigation are not clearly, you can use "scope notes". Scope notes are brief descriptions of the main page. For example, which is the best label for describing the main content: "Main", "Main page" or "Home"? There are not any standards how to design the label for the main content but Morville and Rosenfeld (2006, 93) gives a good list of labels for the common sites of the website:

- Main, Main Page, Home
- Search, Find, Browse, Search/Browse
- Site Map, Contents, Table of Contents, Index
- Contact, Contact Us
- Help, FAQ, Frequently Asked Questions
- News, News & Events, News & Announcements, Announcements
- About, About Us, About (company name), Who We Are

As index terms, the labels can be used to make navigation easier. Keywords, tags, metadata, taxonomies, controlled vocabularies and thesauri are good sources for index terms. The index terms are useful when creating the list of database's content or search systems. Using the index terms with the website's main page can be a good idea, because the index terms give an alternative way to browse in the website structure. (Morville& Rosenfeld 2006, 95-96).

Labels can be visualized also by icons. Icons and textual labels represent information in much the same way but icons have their weakness. Often icons can be seen in navigation systems as labels, however, with icons there is much more limited language than text. When decision to using icons is made, remember that the picture in icon can be easily mean different thing to other user and from the user view; it may take time to learn the meaning behind the icon. Icons with textual label may be much better choice at first and when users have learned the meaning, you can remove the textual guide. (Morville & Rosenfeld 2006, 97-98).

5.3.2 Labeling systems of the information system

Labeling system was one of the hardest parts when creating the IA. In a technological way, it is not hard to change words but chosen the right labels is. Labels are used almost everywhere in the system, as navigation, as headings, as contextual links and as index terms. The following guides were used when creating well-designed labels for the e-system:

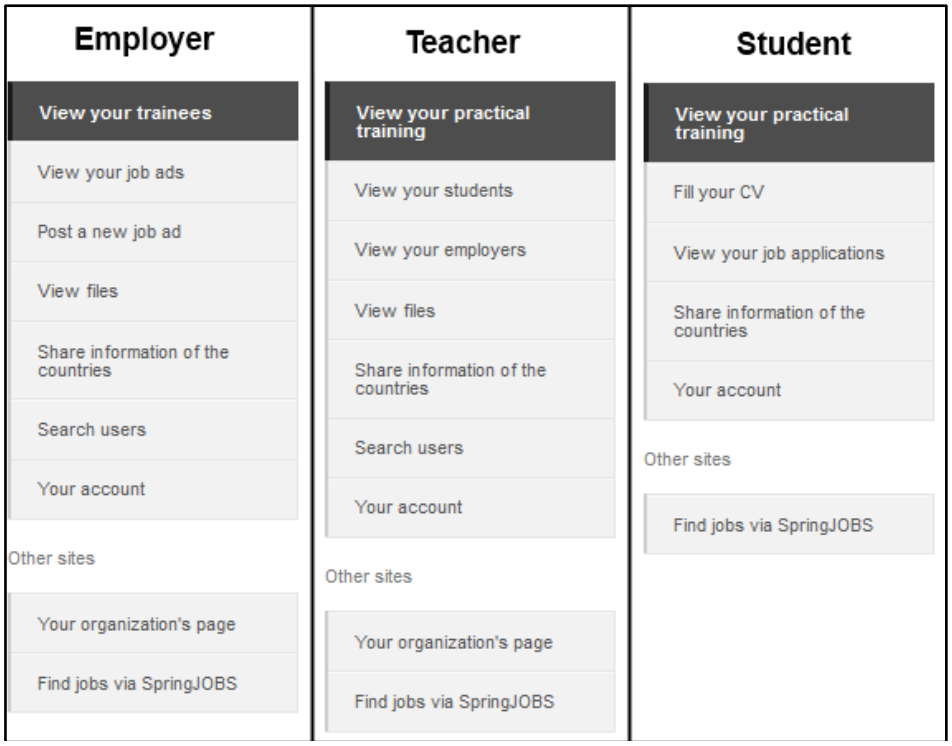
- Content is called by correct name
- Labels are consistent
- There is used terms that your audience uses
- Labels are clear

With these guides it was easier to make labels formatted in a similar way. The background material provided many choices for labels and most of them were first picked from the material. Picking the labels from background material was not just a simple task because the e-system's main language was English. The background material was made in Finnish language, so it takes the time to find good alternatives for Finnish words. However, the material in English was included, which helps a lot of in some cases. In addition, the meeting minutes were good situations to pick good labels, because terms that are used in spoken language are good choices.

Labels are mostly textual and icons are not used because they can be confusing to users. Also, textual labels are easier to management if needed. Textual labels are not only simple words. Two types of a labeling guide were used. First the global navigation includes only one or two words, because those links are used to switch between the sub sites. However, in local navigation and many other situations, a lot of task based labeling is used.

Picture 6 shows local navigation by user roles. There can be seen that labels are not only words, those sentences are answering some of the questions of the users. Decision for the task based labels in the e-system was made by the project group and is not a rare way of labeling items. This kind of style is seen easily in web shops that use task based labeling. For example, "Add item to cart" is a very common example.

The different user roles in the e-system cause problems when choosing labels. Because the IA should support user's information needs, the e-system include different terms for each user roles. For example, Picture 6 shows that in student' user interface, the practical training is called "Practical training". Comparing with employer's user interface, the practical training is called "Traineeship". At the end, the navigation will redirect users in the same landing page regardless of the label. Differences of this kind are important to take into account when creating labels for IA.



Picture 6 Varieties of the chosen labels in local navigation.

Labels in navigation and headings have connections. For example, when user chooses a page from local navigation, the navigation has similar labels than the following landing page heading. This helps people understand where they are located in the e-system and it is also logical, that page has similar labels in heading. The table is made for demonstrate this. The table contains labels from local navigation and heading from the target page. The first column tells the context, where the labels are used.

Table 4 Examples how labels if navigation connect landing page.

Context	Label as navigation	Label as heading
CV	Personal information	Personal information
CV	Requested employment	Desired employment / Occupational field
CV	Personal skills and competences	Personal skills and competences
Student's home	View your practical training	Your practical training
Employer's home	View your trainees	Your trainees
Traineeship module	View milestones	Milestones of the traineeship
Traineeship module	View reports	Reports of the traineeship

Figuring out the labels is not an easy task as there was earlier mentioned. Well-designed labels are dependent on user testing and it is big minus that testing the IA was not possible include the project time schedule. Testing for the user interface will be arranged later and same time the information about how these labels works was collected. The most important thing is that the labels should be understandable.

5.4 Navigation Systems

Navigation systems are one of the important areas in the website. With well-design navigation users can easily find out what they are searching but it is not an easy job to design it. The navigation systems can be divided into three pieces:

1) Global navigation
2) Local navigation
3) Contextual navigation

The global navigation is located on top of the website and it answers common questions like: Where am I and where can I go? The systems allow to users direct access to the main areas of the site. For example, the global navigation systems provide an access to the search function, a link to the main page or information about the logged in user. Usually, the global navigation is in sight always. This major role of the website's navigation has huge impact on usability. In some websites, the global navigation can be hard to identify from the main page, because it does not have a need to be the most distinguishable part of the website. (Morville& Rosenfeld 2006, 122-123).

Local navigation is usually located on a left side of the website and it answers questions like: What is nearby and where can I go? With global navigation, local navigation systems enable the way users to browsing the instant area of the website. The local navigation systems have two primary reasons. First, some areas and functionality of the website need a unique navigation or second, in the large and complex website's each part of categories can have a different group or people responsible for different con-

tent areas and each group has a different way to handle navigation. (Morville& Rosenfeld 2006, 124-125).

The last one, contextual navigation is the actual page that answers question like: What is related to what is here and where can I go? It is meant to use when a piece of information is not fit into existing global or local navigation. For example, "See also" link can refer to a specific page or product. The contextual navigation also supports associative learning and creates flexibility among the website hierarchical structure. When design the contextual links, those are usually related to the surrounding content, so it is good to think what kind of similar information the user could need or may want. (Morville& Rosenfeld 2006, 126-127).

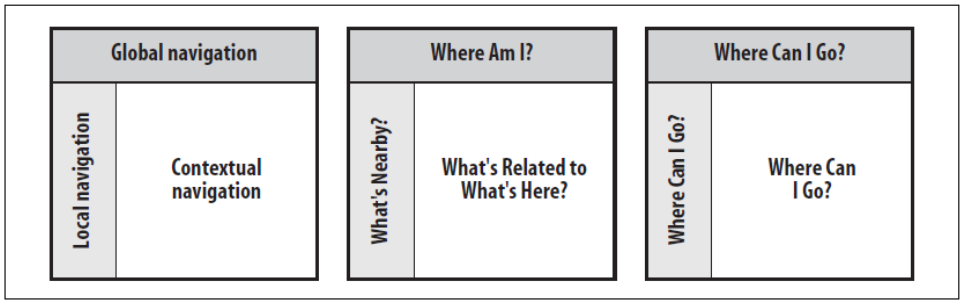


Figure 14 Global, local and contextual embedded navigation systems. (Morville & Rosenfeld 2006, 116).

5.4.1 Supplemental navigations

Supplemental navigation systems give users another way to navigate in the website and the designer must remember that those are only supporting the main navigation. The supplemental navigation is used when the embedded navigation systems fail and the user want try to find information in an alternative way and it can include:

1) Sitemaps
2) Indexes
3) Guides
4) Wizards
5) Searching

Sitemaps, also known as a table of contents, contain the top a few levels of the information hierarchy and represent the organization's structure. This supplemental navigation gives users way to access directly to specific area of the website. The indexes are similar to sitemaps but it present only one or two levels of the hierarchy and the indexes can be used when the information is not so structured. Users who are using indexes probably know what they are searching because the indexes support known-item seeking. (Morville & Rosenfeld 2006, 131-134).

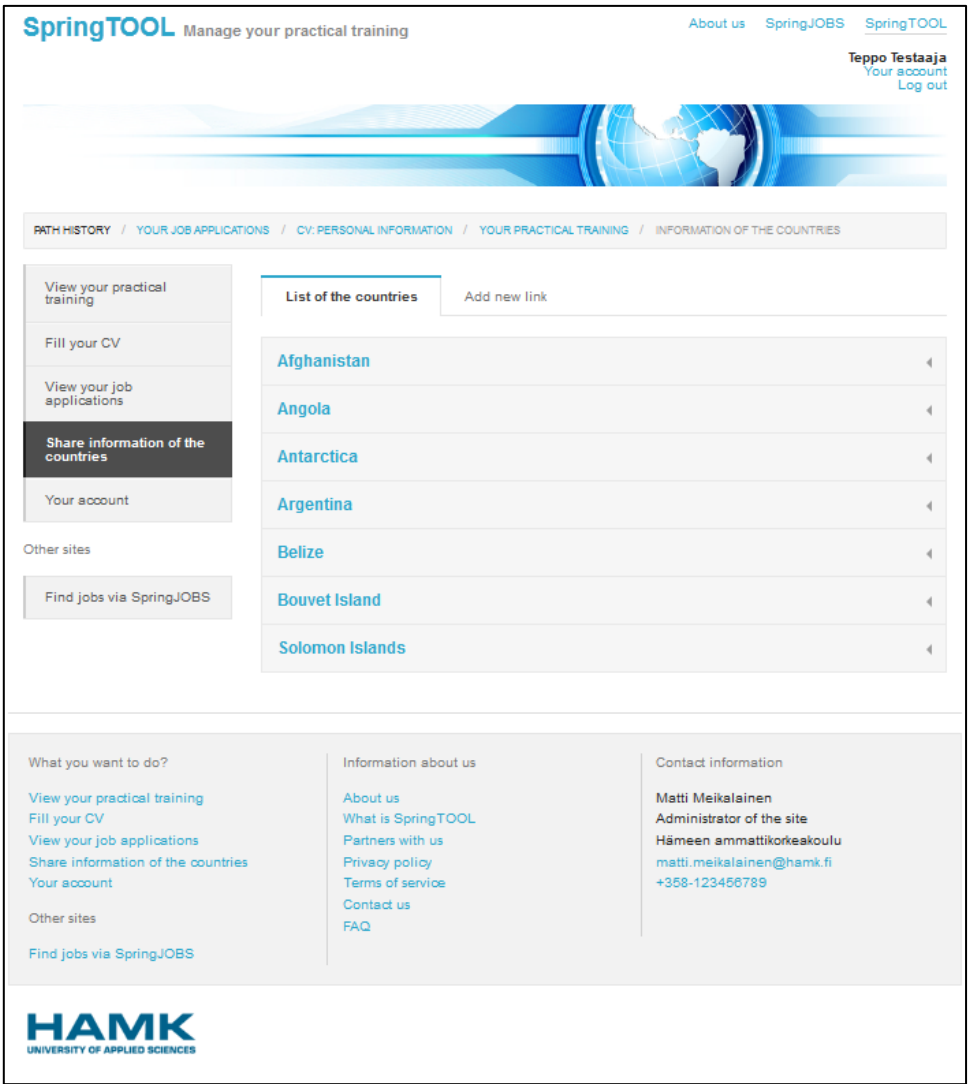
Guides and wizards give users additional information where they are, what the page contains or help the user configure services. Those can be used to introduce new user how to use the system or tells how many steps the user

must do after the specific task is completed. The difference between guides and wizards is that guides can be used for giving additional information and wizards are the more specific class of guide that for example, helps the user to complete an account configuration. (Morville& Rosenfeld 2006, 136-138).

Search systems have been separated into another section because of the size of the content. More about search systems can be found in Section 5.5.

5.4.2 Navigation systems of the information system

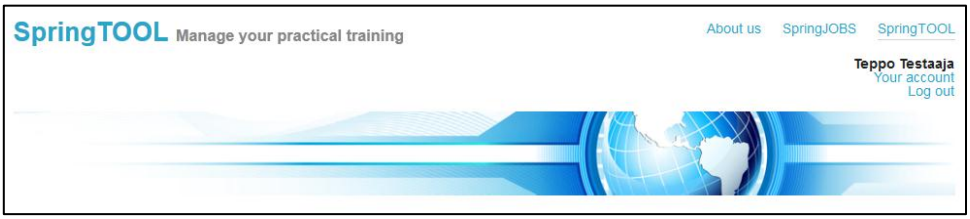
Morville and Rosenfeld (2006) have pretty good basics information about navigations systems in their book. It also goes deeper in the meaning of navigation. This source was a good way to start design the navigation system. In user's view, the most visible thing is the major embedded navigation systems. Picture 7 is used as an example for closer look on the e-system's navigation solutions.



Picture 7 Screenshot from countries information in student's perspective.

At first, the header and footer were redesigned to get the better site-wide navigation system. Before starting to create new things the old site was analyzed with questions that were told in Section 5.1.1. All main parts of the e-system were analyzed. After the analyzing was ready, it was clear the IA was incomplete. Navigation between the main parts of the e-system was hard and confusing to the users. To improve the navigation, the header was designed first.

The header is one of the key parts in the e-system's navigation, because it consists of connections between the sub-sites. Picture 8 shows the structure of header area of the e-system. For example, in the left top corner contain the name and meaning of the sub-site. In the right top corner, there are links to other sub-sites. Actually those three links; "About us", "SpringJOBS" and "SpringTOOL", are shaping the global navigation of the e-system. Below the global navigation, there is a link to managing user account and log out -link. The header area is similar in over the e-system, so the user is not confused when he or she is jumping around the e-system.

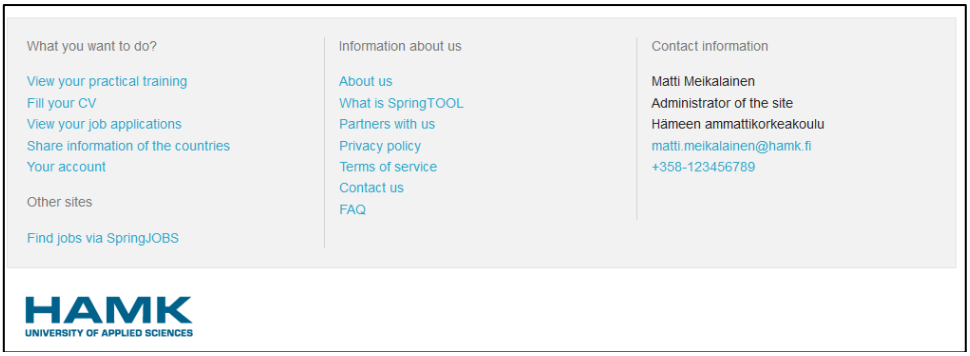


Picture 8 Picture from header area of the e-system.

After the header was ready, similar kind of footer area for the e-system was redesigned. Picture 9 shows how footer area is structured. It includes four main parts:

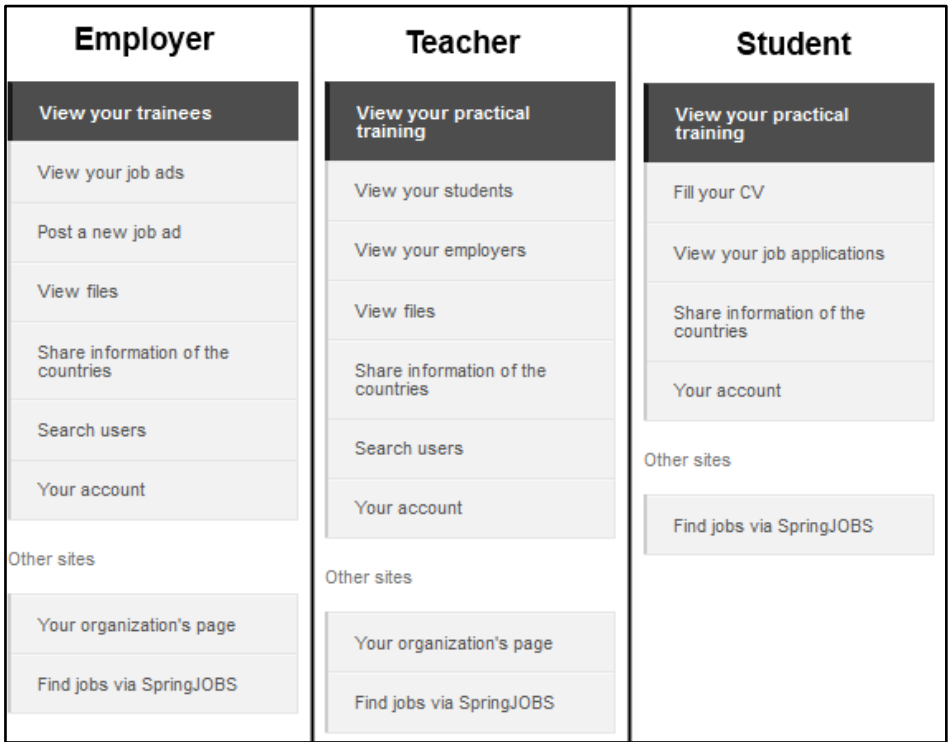
1) What you want to do?
2) Information about us
3) Contact information
4) Space for partner's logos

The left area (1) contains same links as local navigation by user roles. It gives a good picture about the structure of the sub-site. The middle area (2) contains links to the main page that includes basic information about the e-system. In the right corner (3), there is always seen contact the information of the administrator. The place for the partners' logo (4) is reserved at the bottom.



Picture 9 Picture from footer area of the e-system.

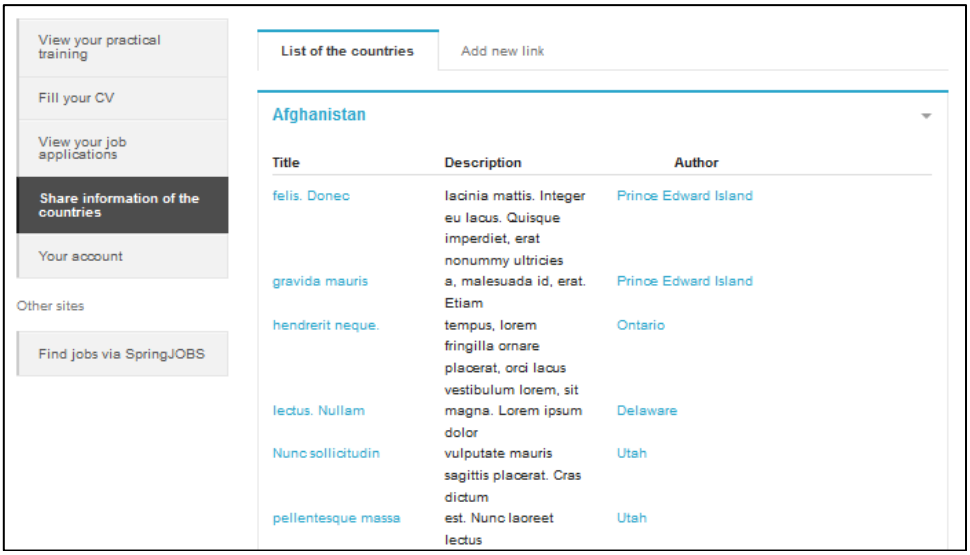
The local navigation is located on the left in all pages. The local navigation includes task based labels as we have mentioned in Section 5.3.2 earlier. The local navigation tells the user what he or she can do with the e-system and it also supports global navigation. All of those items on local navigation can be found also from the footer. Because the e-system contains three different kinds of user roles, there was a need to make unique local navigation for user roles. The picture 10 is the same as earlier but it explain the local navigation in a good way.



Picture 10 Varieties of the chosen labels in local navigation.

The contextual navigation is almost all the time located in the center of the e-system. The picture 11 shows the same page as in above but the content of Afghanistan is opened. The content is not clear because at the moment of screenshot, the sample data was used to present functionality. However, that page is good example for contextual navigation. There can be seen three columns: “Title”, “Description” and “Author”. Title and author columns contain contextual links. Clicking the title column link, the user will be redirected to added URL content. The author column is linked to organ-

ization's public page that is responsible for the link content. Contextual navigation may support associative learning and when design the links, it must be remembered that the links are related to surround content. That is why sometime the users may feel the contextual links confusing.



Picture 11 Picture form the contextual navigation of the e-system.

After the embedded navigations were ready, there was also take time to create a few supplemental navigations. For example, there are sitemaps, indexes around the e-system. However, one of the most important supplemental navigation is the breadcrumb functionality. Picture 12is showing the breadcrumb area that is located below the header. The breadcrumb is made for navigate quickly in previous pages that are saved to session history.

Picture 12 Screenshot of the breadcrumbs navigation.

5.5 Search Systems

Search systems are another form of navigation for finding information and now we only taking a look how the search systems are built. Morville and Rosenfeld (2006, 145-147) approach the search systems asking the question: Does your site need search? This is a very good point of view because the search systems can be expensive to build and are based on various technologies and methods.

There is no rule when you should include the search system in your website but it may be useful, if the website contains a lot of structured or fragmented information. Before start to build the search engine, remember that if the engine is designed not so well, it is not help the users at all. There can be more important focus to design more useful navigation systems. The search systems also bring responsibility to optimize and main-

tain the search engine. To do that, it may take the time and know-how of a professional people.

When should you use search engines? If it is clear that the website contain too much information to browse, the search engine helps users to finding their item. Fragmented sites are problems but the search systems can solve the problem. With the search engine, you can indexes the pages and do full-text searching if the data are not structured. Search engines can be a good learning tool, if the engines are built so well that it can offer to the user various options or similar information during the search behavior. At last, many websites already include search boxes in these days, so the users can expect that it to be there. (Morville& Rosenfeld 2006, 147-148)

5.5.1 The anatomy of search system

The search system is composed of many different parts and technologies. It is not only a search box in the interface. The search box is only a one of the parts and the search process is obvious begun from the interface when the user enters the query and presses the "Search" button. Behind the interface, there is a search engine that makes things happen. The search engine builds a query from the user input and then use algorithm to find correspondence items from content. At last, the search engine sends the founded items back to the interface where the user can see the results. Figure below shows this whole process. (Morville& Rosenfeld 2006, 149)

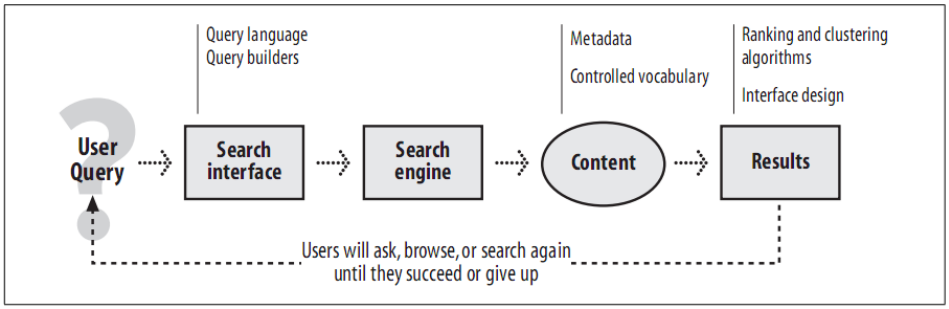


Figure 15 The basic anatomy of a search system (Morville& Rosenfeld 2006, 150).

There are different kinds of retrieval algorithms that you can use to build your search engines. However, we are not going handling these algorithms, just telling the basic idea how the search algorithms work. Fundamentally, the search algorithms are only tools that you use like any other tool. Many of retrieval algorithms are based on pattern-matching so for example, if you type a query "programming jobs", the algorithm retrieves documents that include the string "programming jobs". That is it in a simple form but in the real world the retrieval algorithms can be much more complex. (Morville& Rosenfeld 2006, 158-159)

The retrieval algorithms do one part of the whole search process and there are query builders that can boost your search engine. Morville and Rosenfeld (2006, 161-162) give the common examples of query builders and how those works. For example, there can be spell-checkers, phonetic tools, stemming tools, controlled vocabularies and other tools that include simi-

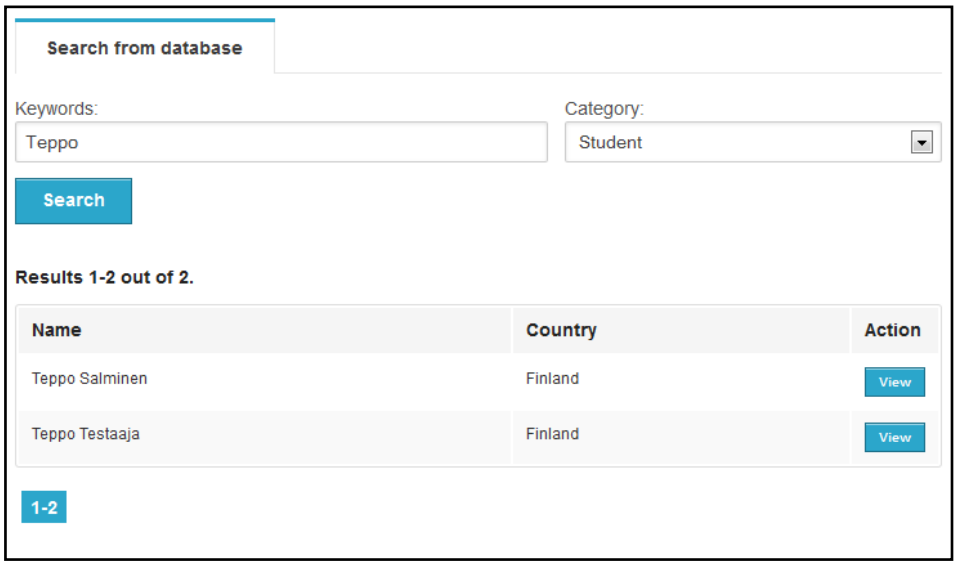
lar terms in the search query. These can be very useful and take the user misspelling into account when they are making the search.

The search process will not end when the retrieval algorithm and query builder have did their jobs and send results in the users. The last thing is to show the results in the interface so the user can understand it clearly what content he or she get. The interface must serve users because the search system is made for the users, not for the developers. The results can show in lists and sort the results by alphabetical, chronology, relevance, popularity or some other way. Depending on that, what kind of information you offer and what users want to search, remember to reserve some time when designing the search interface. (Morville& Rosenfeld 2006, 163-178)

5.5.2 Search systems of the information system

At the phase of the project, there was not concentrated on the search system in detail level. However, the e-system contains the simple search engine and theory of IA was applied while developing it. Decision to building the simple search engine was made by the project group and it was also marked as a feature in the system specification document.

Picture 13 is screenshot from the user interface of the search engine. At yet the search feature is provided only limited users, because it not alone makes perfect IA. It was more important to focus on improving organization and navigation systems first, at the phase of the project. The user interface is only small part of the whole search system and the process of the search engine is invisible to the user.



Picture 13 Screenshot from search feature of the e-system.

The created search system can be divided into following parts:

1) Search interface
2) Query builder
3) Executing created query
4) Result handler
5) Presentation of the result list

The interface (1) of the search engine includes the input field for keywords, drop-down list for selecting the category and the search button. The user's information seeking process starts when he or she adds keywords in the input field. The user can add one or more keywords separated with blank space. The categories list will determine the scope of the search query. Search query can be targeted in students, teachers, employers or universities. The search process starts when the user press "Search" -button.

After the user pressed the button, the e-service sends keywords to the query builder (2). The query builder is the hearth of the search engine in this case. It will handle the keywords and start creating SQL -based query. The SQL is selected because of the used database. However, the query is prepared by the user choices and targeted to specific group. The developer group has been created the query builder and it includes optional parameters in flexible use in the future. For example, it is possible to change searched columns and filters.

When the query is created by the query builder, it will be executed (3) by the database engine. At this phase of search process, the worst results are filtered out. After the query is executed successfully, results will be sending to the result handler.

The result handler (4) is equally important than the query builder. At this phase of the search process, more information is filtered out from search results. The results are compared with the user's input. When all results have been gone through by developed the scoring algorithm, the results will be wrapped in result list.

The result list is send back to the search interface. At this phase, the results are no more filtered. The result list contains only matched items ordered by the scoring algorithm. The search interface will render (5) the results for the user and the search process will end. The search engine includes also "Did you mean?" -feature, if the result list does not contain anything exact answer for the user query.

At this moment, the implemented search system is enough for current use. It is not necessary to spend a lot of time to build a better search engine, because it will take a lot of time and in-depth examination. More resources in the project were spending creating better organization and navigation systems. When an amount of content is growing, the search system will be improved and plans have been made how to do that. Improving the search engine means that vocabularies must be used to boost up the existent

search system. With vocabularies, the search engine can take people ambiguous language into account when the search query is handled.

5.6 Metadata and controlled vocabularies

The simplest description of metadata is "data about data". The metadata is information that describes or relates to a piece of content and there are three different types of metadata:

- What the object is? (intrinsic)
- How it is used? (administrative)
- Description of the item? (descriptive)

The metadata can be used to generate the lists of particular information or choose what to show at a page. Table 5 shows an example from the e-system's database. It demonstrates what kind of metadata is collected when the user adds a country link into the database. (Morville & Rosenfeld 2006, 194; Spencer 2010, 187)

Table 5 Example table from the e-system that contain data about added links

Column name	**Type of metadata**
ID	Administrative
COUNTRY_ID	Administrative
ACCOUNT_ID	Administrative
CREATED	Administrative
MODIFIED	Administrative
URL	Intrinsic
TITLE	Descriptive
DESCRIPTION	Descriptive
KEYWORDS	Descriptive
SCHOOL_ID	Administrative
ACTIVE	Administrative

5.6.1 Controlled vocabularies

Controlled vocabularies are a list of equivalent terms in the form of a synonym ring or a list of preferred terms in the form of an authority file. The vocabularies define what kind of relationships the terms have. There are lots of different types of vocabularies but the simplest is the synonym rings. With controlled vocabularies, you can boost your search engine to be more practical. For example, when the search engine is building queries, the engine can notice all the synonyms of the searched term and can offer the better search results for the user. (Morville & Rosenfeld 2006, 194-196)

An authority file is a list of preferred terms that is strictly defined and does not include synonyms. For example, this kind of list can be used to generate indexes. Classification scheme gives hierarchical structure to the preferred terms. The classification scheme is also called as taxonomy in these

days. The last and the most complex vocabulary is a thesaurus. Thesaurus is “a controlled vocabulary in which equivalence, hierarchical, and associative relationships are identified for purposes of improved retrieval.” Figure 16 shows the types of vocabularies from the simplest form to the complex one. (Morville& Rosenfeld 2006, 197-204)

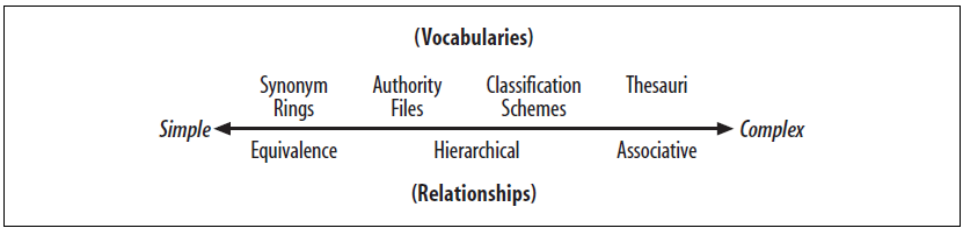


Figure 16 Types of controlled vocabularies. (Morville & Rosenfeld 2006, 195).

5.6.2 Metadata and vocabularies of the information system

At the phase of the project, there was not concentrated on the controlled vocabularies in detail level. More time was spending in understanding the benefits of the metadata. Understanding theory and science behind the vocabularies are another project. But for an information architect, it is good to notice these two areas when creating the IA. More information about the idea of controlled vocabularies can be found Morville's and Rosenfeld's (2006) book and the content in that book is very good.

The metadata cannot be ignored when developing software. In the e-system, metadata is used to improve features. Every time when new features were added, the metadata was noticed. This means, that when the descriptive and intrinsic parts of piece of information were clear, it was a need to add columns for the administrative metadata into database's tables. Thinking administrative parts of the information pieces was hard and time-consuming.

Time that was spending to designing metadata turned out useful during the project. With the designed metadata, it was possible to prepare oncoming changes in feature. It also helps to improve the flexibility of the e-system. Most of the metadata is in the database. The size of the database, the collected metadata is not included in the thesis. However, it is good to focus on metadata while designing the database.

During the project, the benefits of vocabularies were noticed and a plan for the future was made. Good software for to build your own vocabulary is TemaTres (TemaTres 2012). It is an open-source project for creating controlled vocabularies. In future, this kind of vocabulary can be integrated with the search system and improve the search features. At the moment, the search engine will save all queries of the users, because the information about used keywords can be used later to improve the IA. It is not uncommon for the search system, if it saves the history of queries. The queries can represent people language and for example, the labels of the e-system can be improved by analyzing the history of queries.

6 THE DELIVERABLES OF INFORMATION ARCHITECTURE

Deliverables are documents from project to other people. Like in every project, IA is not difference. However, there is not any standard documentation what you need to do. It depends on a lot of your working methods and size of the project. Of course, the organization may have policies how documentation must be done.

While developing the IA of the e-system, the project group not has assigned any specific document that must be provided. It was decided at the beginning of the project that the IA should be documented in some way. The development team makes decision to adding chapter into system specification document that includes information about the policies of created IA. In this Chapter, we are going to check what kind of information the IA guide includes.

The good tip for making documentation is to keep on mind to whom you are writing the document. Is the document coming to your developer team or the client? In the project, the documentation is primary made for the developing team and diagrams is meant to the client. Lastly, the documentation is easier to do when you have designed the navigations systems and sketch of the layout. Remember, that the documentation is only a snapshot from the current situation and it may be an arduous task to update the documentation later.

6.1 Guide document

The project includes the system specification document that includes a lot of information about the e-system. There is a lot of specific information and it is not meant to the other than project group. It is not included in appendix of the thesis for that reason. The document includes the chapter in the IA, which contains some major policies how the IA is development and how to keep it on update. The thesis is also good source to find out, how the IA has been created.

The guide of IA is not mean to understand the whole idea behind IA. It only contains small policies how the current IA can update. For example, with the guide, the next developer can understand the whole picture of the e-system and learn where all the content is located. The guide includes many diagrams that have been made along the project. For understanding context and users of the e-system may be a hard task. There is a lot of invisible information that is only in people head. The guide will ease understanding the invisible information and with other documentation, it is possible to find out the concept of IA.

6.2 Diagrams

While developing the IA, only a few types of diagrams were use. Mainly, those were sitemaps and sketch from user interfaces.

The IA is usually documented as a sitemap but the sitemap of IA have differences between the typical website's sitemap. The IA sitemap can be divided into two types, conceptual and detailed sitemap.

The detailed sitemap holds more detailed information than the first one. Also, there are no standards how to draw this diagram but again, keep it simple. The detailed diagram can contain information about pages and what kinds of structured information are included in the page or who are allowed to enter the specific areas of the website. It depends on you, what kind of information you want to include in it and how to use it. It is good when it suits your needs. When choosing from one of these sitemaps, it is good to remember that how hard it will be to update. The detailed version can be harder to keep on time but it can be necessary with large websites. An example of IA sitemap was seen in Section 5.2.3 earlier. (Spencer 2010, 247)

Internet is full of tools that can ease to create sitemaps. A few tools were mentioned earlier, Cacoo and Slickplan. The simplest tool is a paper and a pen. Visualizing the hierarchy may be good because it makes possible to view the content in out of the box and solve some simple problems ahead.

Sketch from user interfaces were used often and with the sketch, it is possible to share your ideas for other in a friendly way. Even in this case, a lot of great tools can be used. During the project, Cacoo was enough in the beginning. However, when the most of the IA was created, presenting ideas with the sketch was too laborious.

Better ways to do the sketch were looked up and at the end of the project, the development team decided to use the prototypes of the user interfaces only. Rapid prototype frameworks to create the user interfaces were used. When the prototypes were ready, it was easy share ideas for the project group and collecting feedback from meetings. One the biggest advantage with prototypes was possibility to presenting the functionality of the e-system. Static sketch are not always the best way to presenting the ideas.

6.3 Checklist

At the beginning of the thesis, the writer does not have any experience and knowledge about IA, which causes some problems while developing the IA. The biggest problem was the size of the IA, which turned out a very wide subject. For simplify the progress in future IA projects, it was a good idea to make checklist what have been done during the project.

At the end of the project, the checklist for creating IA was made. The checklist is appendixes of the thesis. It includes milestones, how to create the IA from scratch and give a better summary from the wide of the project. The checklist is made for this project but it should be easily adapted to other projects. The primary phases of creating IA are only included and it is developers' decision about how the phases will be done. (Better Practice Checklist 2008)

7 CONCLUSIONS

Defining IA by one sentence is not an easy job. The thesis theoretical part is based mainly on two books. In the books, IA is handled at detailed level and a great number of things are included. The thesis structure is also based on the books and earlier in Chapter 2, the definition of IA is not presented in simple form. However, during writing the thesis, I came across with other definition of IA. One of them particularly stands out.

"Organization of information to support findability, manageability and usefulness from the infrastructural level to the user interface level." (Downey & Banerjee 2011)

The above quote is taken from the website called Journal of Information Architecture. My opinion is that it simplifies the idea of IA and it is more understandable than definitions in the source books. It is not better but somehow it describes the concept of IA a very well. In future, I will recommend use the above definition, if you have to put the whole subject in one sentence and present the idea of IA to other people.

With good sources, it was easy to divide IA into logical components. Of course, there are many ways to breaking the IA in parts but Morville's and Rosenfeld's (2006) categorizing was one of the best that I found. It is not going too detailed levels, as the alternative way to categorizing components of IA. Understanding the meaning of the components is not just a simple task. There is a lot of more than just a few things while working with the components. For example, the controlled vocabulary is not just saving words in the database, it is a lot of more.

All the components were not handled at detailed level in the thesis because it would have taken much more time. It is pleased that it was possible to handle three out of five components. However, it does not mean that the components are now clear. Still, there is a lot of studying from the components and in future IA is changing because the variety of devices will grow and the IA is changing along. For example, mobile devices are part of everyday life in future and IA of websites is not working the same way in mobile devices. While developing a website for the mobile device, the IA of websites cannot be applied directly because of the diversity of clients.

IA is effecting in software development in nowadays and in future, I believe that it is noticed more and more. The designing of IA can be included in the software development process but it can be ignored easily. If you do not know the idea behind of IA, you easily concentrate only secondary issues. The designing of IA will effect in many areas of software development when it is used in the right way. Still, whose duty is to design the IA?

Because IA exists, we have people who are working with that subject. There has been discussion about whether we really need information architects? Large organizations can have teams of IA but it is not necessary to specify someone to be an information architect. If we are realistic, the

IA is happening anyway. Morville& Rosenfeld (2006, 18) gives a good example of information architects and it is an apposite remark.

” A huge percentage of legal decisions are made every day by business managers rather than by their lawyers. ” (Morville & Rosenfeld 2006, 18.)

Based on the quote, I believe that there are more and more people working with IA in the future but not necessary with the title of information architect. The design of the IA will probably be part of software developers' work. With some guides, it is possible to create good IA and concentrate more on the end-users than the features of the software. It can be seen in other fields of industry also, that users are more and more taken into account while design products or services for them.

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Appendix 1

Checklist for the information architecture

Summary of the checkpoints	Done	Undone	Comments
Context			
Are the main areas of the context understood?			
The goals of website			
Are there policies in user interface or existing design?			
Understanding how the organization is working?			
Are right people involved in the project?			
Users			
Who are users of the website?			
Information needs of the users			
Determine services, functionality and information that website will provide			
Describe how users will interact with the website to meet their needs			
Consider what type of website structure will be appropriate			
Content			
Are content of the website clear?			
Identify current behaviour and popular content			
Identify the content required to support the services that will be provided on the website			
Own ideas for the content?			
Check your competitors page and borrow things			
Design components of the IA			
Determine what structure there will be used to group the content			
Determine what classification schemes there will be used for the content			
What kind of organization structures and classification schemes is already used?			
Identify related information			
Create labels to represent information on the website			
Are the labels really clear to the users?			
What navigation systems the website will need?			
Are the navigation systems support users information needs?			
Would the website need search engine?			
Are the above choices supporting the website's content in future?			
Documenting the IA			
Document the IA (sitemaps, wireframes etc.)			
Implementation and testing the IA			
Review the initial structure			
Test the proposed structure with users			
Design navigation elements			
Monitor and evaluate use of the website			