Migrating and governing data in the jungle
A study of migrations and data governance in Seco Tools AB

Ahmad Salman Kanbar
Abstract

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How do you find relevant data in the jungle of a large multinational enterprise? The purpose of this thesis is to investigate how to migrate and set strategies and methods regarding the organizational governance which can provide employees and users to find relevant data to perform their daily work in Seco Tools.

A qualitative research approach has been used to conduct this study. Primary data was obtained through semi-structured interviews with Seco Tools and its parent company Sandvik. Secondary data was obtained through other sources such as scientific articles, books and the internet.

The conclusion of this study is that in order to make data relevant, valuable and easy to find within Microsoft SharePoint, Seco Tools needs to implement migration and information management strategies, policies and methods such as metadata, taxonomies and collaboration strategies for its employees.
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Dictionary

The dictionary gives an alphabetical list of the most commonly used abbreviations and concepts used throughout this thesis.

Content
Anything that is attributed to have some kind of visual, sound or textual information. (Mauthe & Thomas, 2004)

Data
Information that has no kind of context at all within an organization and is considered as “raw facts”. (Brelade & Harman, 2003; Ragab & Arisha, 2013)

Enterprise Content Management (ECM)
Enterprise Content Management (ECM) is the strategies, methods and tools used to capture, manage, store, preserve and deliver content and documents related to organization processes. (Alalwan, 2012 & vom Brocke et al. 2011a; 2011b)

Folksonomy
Folksonomies is a type of taxonomy that allows organizations to crowdsource its taxonomy structure and let the users determine how content should be classified. (Stover & Bordner, 2011)

Information
Data that is inserted into some kind of context such as “Marketing” or “Production” and is processed. (Brelade & Harman, 2003; Ragab & Arisha, 2013)

Knowledge
Information that is understood by its links between pieces of information, patterns and experiences from people. (Brelade & Harman, 2003; Ragab & Arisha, 2013)

Multinational Enterprise (MNE)
An enterprise which has operating subsidiaries, affiliates or branches which are located in foreign countries. (Eiteman et al., 2010)

Taxonomy
Taxonomy is a science for the subject of classification which can provide a conceptual framework for discussion, information retrieval and discussion. (Conway and Sligar, 2002)
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1 Introduction

The introduction chapter has the purpose of giving the reader an introduction to the selected topic of the study. In this chapter a background and problem statement of the subject will be given to provide a better understanding of the thesis. Besides a background and problem statement, the chapter also explains the research question, purpose, target audience and limitations and delimitations in the thesis. An introduction and background of the studied organization Seco Tools and its parent company Sandvik will also be presented.

1.1 Background

The creation, exchange, storage and organization of information is an old craft that has existed for thousands of years in the form of libraries and archives. The management of information is also one of the most significant competitive capabilities for an organization. Two of the main differences of today’s information society compared to the old libraries and archives is the large amount of information that has to be managed and what kind of type of information that has to be organized. (Mauthe & Thomas, 2004; Forsyth, 2004)

Knowledge management (KM) is a new kind of unique discipline and is still in the process of developing its small theoretical foundation. (Darroch, 2005) The purpose of KM as a discipline is according to Satyadas et al. (2001) to provide an organization with processes, technologies or strategies in order to increase its learning. KM has emphasized predominantly on views that are system oriented and with a technology application focus that ranges from traditional data-processing areas as e.g. supply chain management (SCM) to networks. Many organizations have today invested large amounts of resources in knowledge management (KM) and a large part of these investments have resulted in failure. (Chua, 2009, Storey & Barnett, 2000; Lucier & Torsilieri 1997) Large investments in IT infrastructure and technology does not always result in successful KM strategies. Instead the main focus to succeed with KM initiatives is to commit the employees and that they are willing to participate. (Wasko & Faraj, 2005 & Lin, 2011)

Randeree (2006) explains that information and data management has been greatly researched in the field of information systems but the focus on knowledge has not been researched much at all. This becomes a problem because knowledge management has become progressively more important to the business functions of organizations. The reason to why knowledge management is becoming increasingly important is because intellectual resources is a key element for competitiveness in today’s global environment. (Randeree, 2006 & Kimiz 2011)

The widespread and worldwide use of computer related technologies has over the decades created complex and large systems into conditions which resist significant evolution and modification. These
types of Legacy Information Systems can create sizable problems such as isolation, non-extensibility, brittleness, lack of openness and inflexibility. Legacy information systems which comprises of old technologies and systems can also pose problems towards an organizations mission because if for example the system stops working it can halt the business operations. (Bisbal et al., 1998)

1.2 Problem statement

Seco Tools which is the focused multinational enterprise (MNE) in this study is currently in the process of planning to migrate its data to a new content management system (CMS). Seco Tools currently uses a groupware software named IBM Lotus Notes and has plans to migrate its data and applications to Microsoft SharePoint 2013 which is a CMS. The migration from IBM Lotus Notes to Microsoft SharePoint is extensive and will include large amounts of information in the form of documents, applications and other sorts of content. The problem of migrating data and governing it in this kind of large scale is new for Seco Tools and the problem that the organization is facing is how different and large amounts of data should be structured into the new CMS so that it can easily be used by users within the organization. IBM Lotus Notes has provided Seco Tools with the possibilities to share, store and manage information for a long time but the organization has still encountered problems. The problems derived from information that is stored in the groupware had not been managed and governed in a structured manner which means that it is difficult for a user to find relevant information for their work while using Lotus Notes. With the migration to Microsoft SharePoint Seco Tools want the information to be structured correctly and therefore create strategies and methods in which information can easily be found at everyone’s fingertips. Even though IBM Lotus Notes as a groupware is designed to be able to handle large amounts of information it still needs some kind of structure set by its users to be able to have organized databases within its system. Seco Tools has some problems with Lotus Notes because they have not set a capable structure that is sufficient to handle and govern large amounts of information. (Dahlberg, 2014; Ekberg, 2014)

About 60 percent of all CMS implementations fail as a result of too high expectations on costs, complexity and failure of implementing the technology. This makes it important for Seco Tools to understand the migration process and how to structure information in Microsoft SharePoint. (Bramscher & Butler, 2005)

Seco Tools is currently using the groupware Lotus Notes as their information system. The problems of using legacy information systems are numerous and can damage the business of the organization. Some of the largest and serious problems of legacy information systems is that they are slow and expensive to maintain due to their obsolete hardware. The maintenance of these systems are usually expensive and time consuming as a result of lack of understanding of the systems and lack of
documentation. Integration is restricted due to the absence of explicit interfaces. Lastly, legacy information systems also are difficult to expand and develop. (Bisbal et al., 1998)

1.3 Research question
The research statement of this paper is based on the problem statement and the question is as follows:

- How can Seco Tools effectively structure and govern its content?

1.4 Purpose of the study
Seco Tools is in the phase of planning to change their old groupware software IBM Lotus Notes to a CMS, namely Microsoft SharePoint. In this change, Seco Tools will migrate information between their systems as it have to be moved from the old system to the new one. This results in that large amounts of data in the form of applications and data somehow have to be structured and sorted in the new system so that it can easily be accessible and relevant for a user. The purpose of this study is therefore to investigate how Seco Tools can migrate and set guidelines regarding information governance which can provide the users of Microsoft SharePoint in Seco Tools to find relevant content to perform their daily work. This thesis also has the aim of answering the research question through empirical data obtained from Seco Tools, Sandvik and relevant secondary data which is found applicable.

1.5 Target audience
This thesis is primarily targeting the employees in Seco Tools and Sandvik that work with content management. Academics are also a primary target audience for this thesis because it is academic and can help understand the problems of knowledge management and migrations in multinational enterprises and, SMEs (Small and Medium-sized Enterprises) and other types of organizations.

1.6 Delimitations and limitations of the study
This thesis is delimited to the study of knowledge management, enterprise content management, migration processes, and how to govern information in Seco Tools and its organization. The thesis is also delimited to the investigation of how internal information should be managed within Seco Tools. Internal information refers to the data that exists within the different departments within the organizations, such as IT, marketing, finance, production et c. It would be possible to investigate how information should be managed looking at master data (e.g. customer information, invoices and other type of external data) but this would result in the study being too overwhelming. This type of information is also almost exclusively archived in other types of systems than CMS as SharePoint or groupware’s as Lotus Notes. (Persson, 2014) Master data and external data are therefore excluded from this study.
Another limitation in this study is that I have focused on researching IBM Lotus Notes and Microsoft SharePoint because these are the relevant software for this study.

1.7 Seco Tools and Sandvik
Seco means “I cut” in Latin and has its roots from the old company Fagersta Bruk which manufactured cemented carbide tools in 1932. During the period 1968 - 1972 several manufacturers of cemented carbide tools were bought and Seco Tools separated from Fagersta Bruk and became its own organization. Seco Tools is today a multinational enterprise with about 5,000 employees around the world. The organization owns over 50 entities and a large number of distributors and agents in over 60 countries. The enterprise has its headquarters in Fagersta, Sweden and is the world leading in metal cutting and manufacturer of cemented carbide tools for inserts in its area and produces a variety of different kinds of products and tools such as inserts and carriers. Seco Tools became part of Sandvik in November 2011 in the business area “Sandvik Machining Solutions”.

Seco Tools is a part of Sandvik which a global industry concern which operates in about 130 countries worldwide. The Sandvik concern has about 47,000 employees of which about 10,000 operates in Sweden. The organization’s operations are based on the extensive knowledge about industrial processes, close customer cooperation and unique expertise in materials technology. Sandvik possess world-leading positions in products of advanced stainless steels, titanium, metallic and ceramic resistance materials, special alloys, equipment and tools for the mining and construction industries, various processing systems and tooling systems and tools for metal cutting and components in cemented carbide and other hard materials.

Sandvik operates within five business areas that are responsible for the organizations research and development (R&D), production and sales for its products. The five business areas are Sandvik Mining, Sandvik Machining Solutions, Sandvik Materials Technology, Sandvik Construction and Sandvik Venture. Seco Tools is a subsidiary that operates within Sandvik Machining Solutions. In Sandvik Machining Solutions, Sandvik and its subsidiaries are market leaders in tools and tool systems for advanced industrial metalworking. The products within this business area are made of cemented carbide and other types of hard material such as diamond, special ceramics and boron nitride. Sandvik Machining Solutions has approximately 19,100 employees stationed around the world.
2 Theoretical framework

This chapter describes the relevant theories which have been found applicable to the research area of this study. All information that can be found in this chapter is academic and have references to various academic journals, scientific articles and books. The chapter begins with introducing knowledge management definitions and its concepts. It later continues to explain enterprise content management, content management systems and groupware’s. Different migration processes and methods are discussed with reference to Lotus Notes and Microsoft SharePoint. This chapter also explains content and how data can be managed and governed using metadata, taxonomies, folksonomies and a conceptual framework.

2.1 Definitions in knowledge management

2.1.1 Defining the concept of knowledge

The use of knowledge within organizations are of great importance in the present postindustrial society. Knowledge has become a key asset for organizations but managing and nurturing it contains challenges. Unlike manufacturing activities which are easy to control and monitor, knowledge is difficult to monitor and control. The reason for this is because an organization only internalizes a part of knowledge while the other part is internalized by the personnel and individuals that the organization consist of. (Bhatt, 2002) Another challenge with knowledge is because of its characteristics. Knowledge has progressively over the years become viewed as an intellectual resource or commodity. (Kimiz, 2011) When comparing knowledge as a commodity against other valuable commodities there are some clear and profound distinctions and characteristics. These radical differences are the following:

- The transfer of knowledge does not result in losing the information. (Ibid)
- Knowledge that is used is not consumed. (Ibid)
- A large part of an organizations beneficial knowledge lies within the employees themselves. (Ibid)
- Knowledge exists in bountiful amounts but the capability of using the information is limited. (Ibid).

Knowledge should also be seen as a commodity that exists in all organizations regardless of size and location, but it isn’t always explicit or easy to understand. To find knowledge and information within organizations or elsewhere refers to processes that provide organizations the capabilities to make use of and understand objects that contain information, data and knowledge that could currently exist but that is not analyzed, accessible to users or codified. (McInerney, 2002)
Figure 1 shows the classification of knowledge and what it consists of. All stages represents knowledge at different levels of understanding. The first stage is data which is information that has no kind of context at all within an organization and is considered as “raw facts”. This could be any kind of information that exists within an organization but that nobody knows where it belongs or what it is useful for. When data is inserted into some kind of context and is processed it becomes information. Data becomes information when for example it can be determined that it should categorized as “Finance”, “IT” or “Marketing”. Now it therefore has a better context and higher value. When you begin to understand and create links between pieces of information, understand the patterns and experiences from people, then it becomes knowledge. Finally when all the principles behind all patterns are understood then it becomes wisdom or content, which is the highest stage in understanding information in the figure. (Brelade & Harman, 2003; Ragab & Arisha, 2013)

Data, information and knowledge have a correlation concerning quality and quantity. When comparing the quantity of data compared to information and knowledge there exists a large size difference. The cause for this difference is derived from that data consist of low quality when viewed from a knowledge perspective and this is because it seldom has any type of context. In order to enhance the quality of data, it is necessary to combine data from several dimensions so that the data has a better context and so that it has a deeper meaning. Figure 2 which is illustrated by Cameron (2011), clearly shows the correlation of quality and quantity of content. (Cameron, 2011)
The subchapter below will discuss the concept of content. As knowledge, content is an important concept to understand in order to migrate, manage and structure important information. It is a key component of ECM as will be seen later in this chapter.

### 2.1.2 Defining the concept of content

Most organizations have several creators of content who create, design, distribute and manage information. Nearly all departments that exist in an organization have some type of contact with content. An example is a marketing department which can produce information that is targeting potential customers, the press or the general public. Marketing departments can produce many different items that contain content such as newsletters, product information sheets, brochures, presentations et c. (Rockley, Kostur & Manning, 2003) Mauthe & Thomas (2004) explains that content is generally anything that is attributed to have some kind of visual, sound or textual information. Content in the context of systems has the characteristics of constantly being available and present for a user. This means that content in systems is by definition always available by request or at certain times. It is something that can be altered, transmitted, consumed, traded and produced in its sum or in pieces. The concept of content can also be defined as consisting of two types of elements, which are the following:
• Essence

• Metadata

Essence can be the material of a program which can consist of for example text, sound, pictures, video and more. The essence is a kind of carrier since it carries the actual information or message. (Mauthe & Thomas, 2004)

Metadata can be defined as a part of essence because its purpose is to describe essence and its different manifestations. The definition of metadata can in turn be classified into three separate parts which are (Ibid):

• Location-related metadata: describes the location, condition and number of copies of carriers et c. (Ibid)

• Material-related metadata: describes encoding parameters, recording specific information and available formats. (Ibid)

• Content-related metadata: gives descriptions of the subject matter or the actual content. (Ibid)

The knowledge management section below has the purpose of giving the reader information on how knowledge can be managed and which challenges that can arise from it.

2.2 Knowledge management

Knowledge management (KM) is a broad concept and can have several meanings depending on which author that addresses the subject. For a long time knowledge management was defined as a process that applies systematic approaches to managing, structuring, disseminating and capturing knowledge in an organization. The purpose of KM was to be able to work more efficient and faster, being able to reuse previous practices and reduce reworks. (Nonaka and Takeuchi, 1995; Ruggles & Holtshouse, 1999; Pfeffer and Sutton, 1999; Pasternack and Viscio, 1998; Kimiz, 2011) KM also involves methods for using and sharing knowledge within an organization by establishing knowledge sharing value systems and practices. (Ringel-Bickelmaier & Ringel, 2010) In large organizations KM is often seen as necessary to be able to link information at the right time to the right people. (Brelade & Harman, 2003)

Managing knowledge in an organization is not a simple task. According to Quinn et al (1996) knowledge can be referred to professional intellect and it is therefore the people in the organization that create knowledge.
It is important to have some kind of knowledge management within a business because most organizations have a high output and input of information to their business that needs to be managed. (Ringel-Bickelmaier & Ringel, 2010)

Brelade and Harman (2003) explains that knowledge management consist of managing information, technology and people. If any of these dimensions are taken in isolation then it is unlikely that one will succeed in creating the required results with knowledge management. Knowledge management is therefore not solely e.g. a technology such as Microsoft SharePoint. To have Microsoft SharePoint and implementing it in the organization is not enough. People management is an important factor to consider in KM initiatives as it emphasizes on the skills, creativity and knowledge to share and capture information within an organization. People are important to manage because if they are not then there exist a gap of what they know, the expertise and information available to them and what they do in their daily work. By managing people successfully then an organization can put the right people on the right position and effectively use the knowledge that they possess. (Brelade & Harman, 2003)

Employees and people can be seen as human and intellectual capital that are important elements in knowledge management because they possess intangible collective and individual knowledge, abilities and skills. (Ivana, 2010)

It is also important that knowledge management focuses and identifies what that is relevant and important for the organization in order to find information that adds value that can be put into a context, i.e. content. To try to codify and identify all kinds of knowledge would be very difficult. (Brelade & Harman, 2003)

The next subchapter will explain some additional concepts found in the knowledge management terminology. This subchapter assists the reader of this study to understand confusing aspects of knowledge management.

2.2.1 Additional knowledge management terminology

Bryan (2003) explains that one of the most confusing aspects of knowledge management is to explain and clarify what constitute information, knowledge and data. These concepts are closely related and can often seem to refer to the same concept. There exists differences that should be explained and understood. In the text below the different concepts are explained:

- Data are numbers. Data are quantities of numerical characteristic or other types of attributes that has its origins from experiments, calculations and observations. (Ibid)
• Information is data, but set into a context. Information can be explained as a compilation of data and associated, interpretations, explanations and other text based material regarding particular events, objects or processes. (Ibid)

• Metadata is data that gives information. It can contain detailed summaries and categorizations of high degrees of information and data. Metadata provides with the information of the context and which information that is used in that context. (Ibid)

• Knowledge is information. This kind of information is summarized and organized with the purpose of increasing the awareness, understanding and comprehension of information. Knowledge can therefore be seen as a consolidation of metadata and awareness of context where metadata can be enforced in a successful demeanor. (Ibid)

It is worth mentioning that it is common to disorient oneself with the terminology regarding knowledge management with other concepts such as content management and enterprise content management. Knowledge management shares a connection with these concepts and it therefore important that it should be explained what that connection is in order to make the thesis easier to understand and follow. In this study I have followed the definitions of McInerney and Koenig (2011) and Munkvold et al. (2006) which define content management (CM) and enterprise knowledge management (ECM) as major subfields that exists within knowledge management (KM). Content Management Systems should also be seen as a field that falls under KM. Content management (CM), enterprise content management (ECM) and knowledge management (KM) all are concepts that refer to the same thing, namely knowledge and information management. (McInerney and Koenig, 2011) In this paper I will focus on using the definition “Enterprise content management (ECM)” since it is the concept that is used by Seco Tools and Sandvik.
In the next section, I will explain the concept of Enterprise content management and what it can be used for.

2.2.2 Enterprise content management

One of the primary functions of a computer has always been to manage and manipulate content. (Cranor et al., 2003) Content management is a concept that has the purpose of targeting information management widely by achieving greater efficiencies and increasing productivity. It can also generally be described as a combination of business processes and software tools in an organization that grants it the possibility to deliver and manage extensive amounts of diversified information through multiple media in an aspect that is most effective. (Forsyth, 2004)

The management and distribution of extensive amounts of diversified information is an extensively discussed and unanswered problem. Information overload has become a common problem and is intensified considerably by technical innovations such as social media and legal requirements that demand documentation. In 2015 it is estimated that the global information volume will reach about eight zettabytes, which is 400 % more than the volume in 2011 and the majority of this information will be stored in a manner and form that is unstructured, such as e-mails, social media, websites or in other type of textual documents. (Beath et al., 2012) Out of this context, enterprise content management (ECM) arose with the purpose of managing information that is primarily unstructured. (Grahlmann et al., 2011) Most of all unstructured information consists of digital assets such as e-mails, digital images, word processing documents and PDF files. (Blair, 2004)

The first and original definition of ECM by the Association for Information and Image Management (AIIM) organization was the following: “The technologies used to create, manage and customize,
deliver and preserve information to support processes”. This definition can be seen as deficient as it focuses solely on the technological dimension of ECM. Technologies are indisputable a very important element of ECM but ECM is more than just software. The challenges that organizations face when adopting ECM can therefore not be entirely solved on the basis of only using technology. Blair (2004) gives a more holistic perspective and definition of ECM by stating: “The people, processes and technology of ECM are the keys to understanding these challenges and addressing them in strategic ways”. (vom Brocke et al., 2011) Alalwan (2012) and vom Brocke et al. (2011a, 2011b) define ECM using the definition: “Enterprise Content Management is the strategies, methods and tools used to capture, manage, store, preserve and deliver content and documents related to organization processes. ECM tools and strategies allow the management of an organization’s unstructured information, wherever that information exists”. ECM occurs through the management of information in all its forms in an organization. The purpose of ECM is therefore to deliver, preserve and capture information as a resource for the organization in a way that is reusable and natural so that an organization can enhance and sustain their investments in knowledge. Methods, strategies and tools within ECM assists organizational management to manage information that is unstructured regardless of its location and its time. (Cameron, 2011).

Many organizations are facing problems to find information that is accurate and valuable to make important decisions that can affect their businesses. Information within organizations need to be reliable since it is auditable which means that it is under scrutiny. ECM has an important role in organizations because digital information assets needs to be managed not solely because of growing information volumes but also because organizations need to comply with and follow regulations, directives and laws concerning the management and care of information. Organizations also need to make digital information assets useable and accessible to the business needs because it can improve its efficiency and strategic competence. (Ibid)

Information also needs to be reliable so that the stakeholders have accurate information of the business. ECM provides these organizations with a tool to find valuable and accurate information by understanding the value of the information that the business possess, share ideas, create business propositions and protect its knowledge. With ECM an organization can better understand how to use powerful content structures without losing control of the information that exists within them. (Blair, 2004)

The foundation of any ECM solution can be found in the understanding of content but also its role and the context it has in an organization. (Päivärinta & Munkvold 2005) This type of understanding consist of several broad and challenging subareas such as:
1. Content life-cycles  
2. Metadata  
3. Corporate taxonomy

In this thesis I have focused on the subareas of content-life cycles, metadata and corporate taxonomies because these three areas provide organizations increased browsing and retrieval of information through conceptual and logical structuring of content resources. They also makes it easier for an organization to retain information for longer periods of times as records. These features can help provide to answer the research question. (Päivärinta & Munkvold 2005)

The areas of metadata and taxonomies are also frequently discussed throughout the areas of knowledge management and enterprise content management researchers. (Päivärinta & Munkvold 2005; Mclerney, 2011; Conway and Sligar, 2002; Cameron, 2011; Cheung, Lee and Wang; Bjork, 2001; ISO 15489: 2001, Sheriff, et al., 2011)

In the following subchapter I will discuss an enterprise content management model to increase the understanding of ECM and what it consists of.

2.2.2.1 Enterprise content management model
Cameron (2011) states that ECM can be seen as a methodology and a strategy. The name ECM is an acronym which is self-explanatory. It consists of three overlapping concepts which can be seen in the figure below:

![Figure 4: Elements of enterprise content management (ECM) (Cameron, 2011)](image-url)
• Enterprise is the perspective in ECM that explains all functions of application, distribution, acquisition, publication, access and capture in an extensive and consistent disposition without boundaries. The enterprise perspective explains how and where ECM takes effect. (Ibid)

• The content perspective explains all information, components, data (structured or unstructured), rules, records, structures, templates and topics. This perspective explains what makes up ECM. (Ibid)

• Management is the perspective that accumulates all aspects of processes, communication, workflows, interaction, collaboration and exchanges with stakeholders. This perspective explains which parties that are involved in ECM and why and when they interact. (Ibid)

Derek (2007) explains that archiving and storage is about assuring that content can or cannot be found by staff within or outside an organizations. It also ensures that the correct metadata is applied at the right type of material, detail and that material and content is stored in the right place with access and security rights set.

The next section will present theoretical information of how to manage content using content management systems (CMS).

2.2.3 Content management systems
Within the notion of content management there exist content management systems (CMS). The definition of a system that manages both metadata and essence (i.e. content) is called a content management system (CMS). CMS software has the purpose of providing an approach to properly manage information. (Mauthe & Thomas, 2004)

In the following sections I will try to give short introductions to the CMS that Seco Tools is going to use in the near future, i.e. Microsoft SharePoint. I will also give a short introduction to the current groupware that Seco Tools currently has. The purpose of giving these system and platform introductions is to give the reader interesting information and a better understanding of the systems and platforms, their history and how they work.

2.2.3.1 Microsoft SharePoint
Microsoft SharePoint is a concept that has become increasingly common in workplaces around the world. The Microsoft SharePoint product was first launched in 2001 by Microsoft and is considered to be a web application framework and platform. Microsoft SharePoint contains several different aspects which makes it interesting as a product for organizations. The software contains e.g. intranet, document management, content management and more. (uta.edu)
If Microsoft SharePoint was to be explained as simple as possible it can be described as a web application created by Microsoft that allows organizations to work in an efficient manner by letting its users share data, documents and information. The software is also designed not only to organize, structure and manage large amounts of data but also to archive it, support teams in their projects and work and increase personal productivity. The definition of Microsoft SharePoint can however depend on whom that is working with the product, because it contains different aspects. Therefore depending on the area of application Microsoft SharePoint is for some people a collaboration site and for others it is an information management platform in which you can place and store documents and data. Some other purposes with the product is that it is a workflow engine that makes it possible and helps automate tasks that is done on daily basis. (Lynda.com)

Microsoft SharePoint can be seen as more than an individual program or application because it is considered a platform which can provide users in organizations to create websites that are powerful with different kinds of features and allows for more efficient working processes. Unlike other Windows products such as Word and Outlook that are installed locally on desktops, Microsoft SharePoint is installed on a server. Through a web browser and a website Microsoft SharePoint can be accessed and includes an interface that shows libraries and lists in a secure database. (Lynda.com; uta.edu)

2.2.4 Groupware
2.2.4.1 IBM Lotus Notes
Lotus Development Corp originally created IBM Notes in 1989. In 1995, Lotus Development Corp was acquired by IBM and became the Lotus Development division of IBM. IBM Notes is today currently part of the IBM Software and System Group which is known as IBM Collaboration Solutions.

A large problem in MNEs today is answering the question of how they should change data into information that can be used by the employees of an organization. How can statistics be converted into management tools? To do these kinds of transformations, it is necessary to perceive data at different types of vantage points and to be able to share relevant information throughout the organization. IBM Lotus Notes is a so called groupware, which provides organizations with the tools to make these kinds of transformations possible. (Bates & Allen, 1994; Scitech Book News, 2006) Groupware or collaborative software as it is also known as are programs that makes it possible for users to work collectively together while being located remotely from each other. IBM Lotus Notes provides organizations with sophisticated messaging systems, browser, notebook, calendar, resource reservation clients, collaborative application support and large databases containing different types of data. All these functions are usually found in software that are classified as groupware. IBM Lotus Notes also provides organization functions support and automate different kinds of business
functions and to create, store, collect, share and manage information in a central location and make it accessible to users. (Bates & Allen, 1994; Scitech Book News, 2006; Calabria & Burke, 2006; Searchdomino.techtarget.com, 2014; Brelade & Harman, 2003).

The foundation of IBM Lotus Notes is based on a server/client technology which enables organizations to share, access and manage information in a network. The size of the network can be everything from 10 computers in an office building to over 30,000 computers worldwide. IBM Lotus Notes stores all its information, including e-mail in its Domino applications or databases. The Domino applications or databases is actually collections of one or more databases and has the purpose of performing specific work processes or functions. (Bates & Allen, 1994; Scitech Book News, 2006)

In the following section I will discuss some of the advantages that Microsoft SharePoint has over IBM Lotus Notes.

2.2.5 Advantages of Microsoft SharePoint
The migration from IBM Lotus Notes to Microsoft SharePoint should be seen more than transitioning applications and content to a new platform. This is because a migration between these two systems allow the opportunity to transform the organization to become more productive, cost-effective and agile. (Dell.com, 2014)

In the following text I will present the advantages of using Microsoft SharePoint.

Cost effectivity and productivity advantages:

The cost effectivity of migrating to Microsoft SharePoint from Lotus Notes is one of the main reasons organizations change platforms. SharePoint provides better and improved productivity compared to Lotus Notes, as it requires almost no training. The reason to why SharePoint requires little amount of training is because of its familiarity. This familiarity has arisen from that most users today are familiar with using platforms that are developed and designed in a Microsoft environment. An example are e-mail applications such as Microsoft Outlook which look very similar to Live and Hotmail and have similar user interfaces (UI). The familiarity that exists with the Microsoft environment makes it easier to users to be more productive. Across all Microsoft platforms such as Excel, Word, Microsoft ERP, CRM applications and Outlook have the same UI which can interact with each other with ease. The UI on all these platforms looks the same and are easy to remember as a result. As all platforms are similar, users require less training when compared to Lotus Notes, which can have several types of UI depending on the application that is used. (Ibid)
**Capability enhancement advantages:**

Microsoft SharePoint provides besides cost effectivity and productivity advantages other types of advantages, such as capabilities advantages that are more advanced and improved than capabilities found in IBM Lotus Notes. (Ibid)

To be able to **search** for content in organizations is very important. The search technology residing in Lotus Notes had a leading position when the Lotus was launched but it has not changed much in the last decade and compared to SharePoint. Microsoft SharePoint has for example the capability of rating search results which allows users to see which search result that is the most important and relevant for their query. (Ibid)

Another capability enhancement advantage with Microsoft SharePoint is that it allows better **integration** between applications. SharePoint provides better integration with Microsoft Office and Office 365 applications. This is beneficial system advantage because if a user publishes a Word document in SharePoint then several users can edit and view the document at the same time and together from different locations. (Ibid)

**Workflows** is capability that Lotus Notes is struggling with. In Lotus Notes there does not exist an integrated workflow engine which can assist activities such as reviews, approvals and task assignments. Microsoft SharePoint has the advantage of having a workflow engine integrated into its software which is less expensive and faster than custom third party workflow engines that are available to Lotus Notes users. (Ibid)

**2.2.6 System migration**

Many organizations choses to migrate (or “move”) their applications and data from one system to another. The migration of information can originate from different reasons for an organization. One of the most common reason to why a migration is conducted is because old systems are becoming obsolete and its technology are starting to become outdated. New requirements arises with time and as organizations grow. To meet these requirements software also has to be new, updated and capable. (Wilson & Van der Beken, 2003)

Another reason to why an organization choses to migrate between systems is because the old system have limited capabilities to be further developed. A system may not be further developed as a result of the supplier no longer provides development and support or because that the platform is no longer supported by the supplier. (Ibid)
Organizations usually use several types of systems that are mostly built with different technologies and on different platforms. Most new systems that are developed today can manage to handle different types of competences which makes old systems obsolete as they are no longer needed. Therefore to use fewer newer systems and less old systems is in the interest of most organizations as their development and maintenance costs decreases in relation to the fewer systems that they use. (Ibid)

The next subchapter discusses how migrations to Microsoft SharePoint can be accomplished.

2.2.6.1 Migrating to SharePoint
Migration from Lotus Notes to SharePoint can be a long process, especially for an organization such as Seco Tools which have thousands of different documents and applications. As explained earlier in the introduction chapter by Bramscher & Butler (2005), a majority of CMS implementations fails due to several different reasons. The reasons to why a majority organizations fail with implementing SharePoint are usually because they have poor planning or lack of understanding of the technology. Other reasons and normal factors of a failed implementations are unclear objectives and goals, unrealistic resource and time estimations, lack of user involvement and executive support and failure to communicate and act as a team. (Stover & Bordner, 2011)

The migration process of applications and data from Lotus Notes to SharePoint consists of a two-step process. The first process is when the organization moves the application and data content. The second step is when you migrate the application design. (Walch, 2011)

In this subchapter I will discuss some methods of migrating to SharePoint. Before explaining the methods of how to migrate to SharePoint it is worth mentioning that there are three ways of storing content in SharePoint, namely lists, libraries and pages. All these ways have variations from each other and it is important to understand what their differences are in order to find the most suitable choice depending on the organization (Ibid)

Lists can be seen as similar to the tables that exist in relational databases. Lists are flat collections of records (also known as Items in SharePoint) consisting of data, they also consist of data fields (known as columns) of fixed sets. Every data column has a fixed type and name. Lists in SharePoint can have several binary attachments and views. In SharePoint, views is something that allows users to sort and select items in multiple ways. (Ibid)

Lists is one of the closest ways of storing content in SharePoint that is similar to the way of storing content in Lotus Notes. In Lotus Notes the closest equivalent method of storing content compared to Lists are Notes databases. The difference between a Notes database and lists is that lists have a high
degree of structure consisting of a fixed schema. The Lotus Notes databases are unstructured in comparison of which every document have different set of data items. (Ibid)

**Libraries** can be seen as collections of binary files such as Word documents, audio clips or images. Libraries and lists share many similarities with each other but there are a few differences. Lists contain several binary file attachments, while in libraries in the binary file is the document. Libraries focus on having many types of data columns with the purpose of capturing additional information about each document that exists while libraries has the emphasis on document management functionality such as check-in/check-out and versioning. (Ibid)

When comparing Libraries with the Lotus Notes world, the most similar thing is a Domino.doc file cabinet. The Domino.doc file is known as a once known famous document management system which was built upon the Notes system. (Ibid)

**Pages** is considered to be a building block of all sites that exist within SharePoint. These pages can be viewed in the web browser and are web pages that you can see every time you click on a link in order to view a site, enter information, and open a document or anything else. All sites in SharePoint can be used as data documents to store data and in SharePoint there are many types of content sites and pages that can be created, such as wiki pages, web part pages, publishing pages and basic pages. (Ibid)

In Lotus Notes there does not exist a perfect equivalent to content pages but pages can be used to migrate certain types of Notes application. Some Notes applications that are fit to migrate to pages in SharePoint are applications consisting of libraries with rich text pages which have large amounts of users. (Ibid)

In the following subchapters I will explain some ways of migrating information from Lotus Notes to Microsoft SharePoint using the list, libraries and pages concepts discussed above.

**2.2.6.2 Migration methods**

There are multiple ways of migrating data and applications from Lotus Notes to Microsoft SharePoint. In the following subchapters I will explain some of the methods that are available when migrating information and applications.
2.2.6.2.1 Migrating to Microsoft SharePoint

The following table figure shows some ways and methods of migrating applications and data from Lotus Notes to SharePoint. (Walch, 2011)

<table>
<thead>
<tr>
<th>Methods of migrating data and applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Migrate to standard lists</td>
</tr>
<tr>
<td>2. Migrate to custom lists</td>
</tr>
<tr>
<td>3. Migrate to Document libraries</td>
</tr>
<tr>
<td>4. Migrate by converting to Microsoft Word</td>
</tr>
<tr>
<td>5. Migrate by converting to PDF</td>
</tr>
<tr>
<td>6. Migrate by converting to InfoPath</td>
</tr>
<tr>
<td>7. Migrate by using document sets Document Sets</td>
</tr>
<tr>
<td>8. Migrate by using Wiki Pages</td>
</tr>
<tr>
<td>9. Migrate to Web Part Pages</td>
</tr>
<tr>
<td>10. Migrate to Publishing Pages</td>
</tr>
<tr>
<td>11. Archive legacy content through document rendering</td>
</tr>
</tbody>
</table>

Figure 5: Methods of migrating applications and data from Lotus Notes to SharePoint. (Own illustration)

In the following sections I will briefly go through some of the above listed methods to give an idea to the reader of how it can be done:

1. Migrate to Standard Lists

In IBM Lotus Notes there were many widely used integrated templates of standard applications which are used by many customers. Calendars, discussion databases, team sites, task lists, document libraries and contact lists are some examples of templates of standard applications that were used in IBM Lotus Notes. Most of these templates and applications can be found in SharePoint which for most applications have templates which serve the same purpose as the ones found in Lotus Notes. (Walch, 2011)

If one chooses to migrate to standard lists in Microsoft SharePoint it means that it is possible to migrate content to an equivalent template found in Lotus Notes. (Ibid)

2. Migrate to Document Libraries

As discussed before, a library is very similar to a list but the main difference that exist is that in libraries each “document” is an actual binary file which consist of different data properties linked to it. This means when a migration from a Lotus Notes database to a library occurs one must first extract all the
attachments associated with the binary file out of each Notes document and inserting them in the library. (Ibid)

3. Migrating to Wiki pages

Microsoft SharePoint wiki pages is one of the most popular page types when migrating Lotus Notes content. The reason to its popularity is because of its central design of many SharePoint site templates and because of its simplicity. (Ibid)

As can be seen in this subchapter, there are many ways and methods available for organizations when migrate applications and data to a new platform such as Microsoft SharePoint. Which method and way that is best suited for an organization is difficult to determine but it is important that the migration tool that is selected ensures that all legacy content is preserved in its form with a high level of completeness and fidelity. (Ibid)

In the following subchapters I will explain some general migration methods available and that can be used for different systems and not solely SharePoint.

2.2.6.2.1 General migration methods

An important part when migrating to a new software or platform is to acquire the new software. An acquisition of the new software can be done in several ways, depending on the organization’s resources it can be through personnel or capital. Most migration projects have the purpose of avoiding using old software that cannot is obsolete and cannot be developed. (Bisbal et al., 1998)

When an organization conducts their migration there are four types of migration methods. The first one is to replace software with a finished product which is contributed by third party organizations. The second method is to rewrite all applications in order to meet the requirements of the new system. The third method is to encapsulate existing software in so called wrappers. The fourth and final method is to use a tool to convert the code of applications and data. (Ibid)

In the following sections I will briefly discuss the four general migration methods.

2.2.6.2.1.1 Commercial Off The Shelf software

Commercial Off The Shelf software (COTS) is when an organization purchases a finished software. This method is common when an organization wishes to replace a system or software that solves standard functions such as e-mail and calendars. Some systems are customized for special applications and these systems are sometimes difficult to purchase finished products as some functions can be missing. The result of this is that an organization can be forced to retain their old system although they have a strong desire to change systems. COTS software is usually one of the first alternatives that
organizations choses as it can be difficult and costly to rewrite and convert old systems and large amounts of codes. This is therefore a good choice for organizations that lack resources or that do not want to spend too much on their migration. (Wilson & Van der Beken, 2003)

2.2.6.2.2 Encapsulating
Encapsulating, also known as “wrapping”, is a migration solution that has the purpose of solving certain problems with old software and system regarding their functionality. The wrapping migration method ignores and circumvents the problem of migrating from an old system as it encloses the old system, data and software in order to give it a new interface. One of the most popular wrapping implementations is “Screen Scraping”. This method a process which has the purpose of replacing the character based front ends of legacy system with a graphical user interface that is client based. This method is popular as it is effective and cost efficient. (Bisbal et al., 1998)

2.2.6.2.3 New development
The third general method is to newly create systems and software from the beginning and giving it the same functionality. These new software and systems have the same functions but are not customized to their new environment and consisting of newer technology. One of the disadvantages of using this method is that with complex systems with many functions it can become very difficult to rewrite everything as it can be expensive and take a lot of time. (Wilson & Van der Beken, 2003)

2.2.6.2.4 Conversion
Organizations sometimes possess systems that are developed by themselves and have access to the source code of these systems. This access to the source code allows organizations to convert it to a technology, system or other type of platform which is easier and better to develop. (Ibid)

In order to convert the source code to a new technology, system or platform an organization can use different methods. It can for example manually convert it. This method can be time consuming and expensive as it the source codes usually contains millions of lines of program code. (Ibid)

When using conversion there are several levels that can be used. The easiest level is when only a conversion from one language to another is necessary. This level is regarded as one of the easiest levels because it can be automated which makes the migration and conversion process easy. (Ibid)

A problem that can arise which conversion is when systems changes paradigm in which one migrates from a non-object-oriented language to an object-oriented language such as C# or Java. (Ibid)

The following subchapter will explain an important and useful method of managing and governing information, namely metadata. Metadata can be a resourceful tool after an organization has migrated their content or is in the process of migrating it in order to make it more accessible to its users.
2.2.7 Metadata
The key feature of content management systems today is descriptive metadata, which allows the management of electronic content within all types of organizations. (White, 2005; Sheriff, et al., 2011) Metadata is something that is considered important and vital for an organization because it makes it possible to collect and manage large amounts of data that can easily be found within CMS systems. The concept of metadata can be described and referred to attributes and fragments of data that has the purpose of describing the structure and context of a certain piece of data, document, content or other types of information. (Bjork, 2001; ISO 15489: 2001, Sheriff, et al., 2011)

The use of metadata can provide an organization with many types of advantages. Metadata can for example assist an organization to easily find information, understand the context of data in a better way, and determine its source and re-use it. (Bentley, 2001; Rockley et al., 2003; NISO, 2004; Day, 2006) In addition to metadata resource discovery advantages there are also other types of advantages such as technical specifications, provenance, functionality, content ratings, administration and easier understanding of relationships and linkages. All these advantages and functions that are associated with metadata should be seen as application independent. The reason to why metadata can be seen as application independent is because it can be used in many types of software and is not patented or limited within a certain type of application. (Bjork, 2001; Haynes, 2004) Metadata should enable users of e.g. a CMS system to answer two principal questions, i.e. what information is useful, and where can I find it. (Sheriff, et al., 2011)

When examining metadata more in detail the concept can generally be divided into three types and they are the following:

1. Descriptive metadata: This kind of data is used to identify, find and understand a fragment of content. These types of content can be for example an abstract, title, author or keywords. (NISO, 2004; TASI, 2006, Sheriff, et al., 2011)

2. Structural metadata: The structural metadata allows for the definition and display of different kinds of relationships and associations between content or other types of compound content that consist of smaller fragments of content such as relationships. (Ibid)

3. Administrative metadata: This type of metadata has the purpose of allowing the management of the lifecycle of different types of content and associated technical information which can be for example, file types, date created, restrictions and file size. (Ibid)
To effectively manage metadata in SharePoint it requires careful planning and thought. It is important that one plans the type of information one should use as metadata to manage content that exists in libraries and lists. In SharePoint it is possible to use term sets of metadata terms for large amounts of different information types. (support.office.com)

SharePoint allows organizations to set metadata that identifies relevant facts about it such as:

- Document purpose – Is it an engineering specification or sales proposal? (Ibid)
- Document author, and the names who changed the document. (Ibid)
- Date of approval, data of creation and recent modification dates (Ibid)
- Audience. (Ibid)

The next subchapter will discuss taxonomies which as metadata is an important tool for organizations to classify, govern and manage their large amounts of information.

### 2.2.8 Taxonomies

In many organizations today there is a clear abundance of unstructured knowledge. Cheung, Lee and Wang (2005) explain that the majority of data that exists in computers is unstructured knowledge, comprising up to 80-98%. This data can be for example office documents, e-mails, PDF-files and other types of documents. As a result of this high level of unstructured knowledge, many professionals today need to spend a lot of their times to search for e.g. textual data in order to find the relevant data, information, knowledge and content that exists in the jungle of information. (Cheung, Lee and Wang, 2005)

Knowledge management therefore becomes necessary in order to structure and manage all the unstructured information because when knowledge is unstructured it becomes difficult and inconvenient for staff to organize and share it for re-use. Unstructured knowledge does not solely come from external sources but also internal sources such as corporate platforms, individuals within the organization and intranet. (Ibid)

For a staff member to get access to unstructured knowledge is therefore insufficient. Some kind of analysis is required to classify, organize and manage the unstructured knowledge to a conceptual framework for sharing and acquisition. As a result of this an organization needs to establish some kind of effective taxonomy system which is flexible enough to facilitate analyzing, searching, discovering the right knowledge resources from large amounts of unstructured knowledge. (Ibid)

Taxonomy is a science for the subject of classification which can provide a conceptual framework for discussion, information retrieval and discussion. (Conway and Sligar, 2002) A taxonomy also describes
in a structured manner an organizations industry and specialist terminology. Taxonomies are a fundamental part of governing and organizing content in a system such as Microsoft SharePoint.

(sharepointams.com) All documents that exists within a taxonomy are categorized against it. This makes it easier for users to find relevant documents because the meanings of documents that are indexed will be consistent. In order for a taxonomy to be effective then they must mimic the vocabulary, terminology and understanding of the organization it is implemented within. Taxonomies are important parts of ECM and is used so that content that is archived and stored in it can be better classified and governed. (Cameron, 2011)

To possess an effective knowledge management structure requires a good taxonomy. Single dimensional taxonomies are usually inadequate for the organization and classification of unstructured knowledge management involving multi-concepts. (Cheung, Lee and Wang, 2005)

Managed Metadata Service is the topic of the following subchapter. This is a system function available in Microsoft SharePoint that connects the previous discussed topics of metadata and taxonomies.

2.2.8.1 Managed Metadata Service

The managed metadata service in SharePoint is a collection of central managed terms structured in a hierarchal structure which makes it possible to define and use as attributes for various items. (technet.microsoft.com, 1a) SharePoint metadata management allows organization to use metadata using different approaches, from user-driven folksonomies to formal taxonomies. Formal taxonomies can be implemented through managed term sets and terms. These terms refers to a specific phrase or word that is associated with a specific item that exists on a SharePoint site. (support.office.com)

Microsoft SharePoint allows organizations to classify their content in several ways. There is the traditional way of taxonomy classification which consist of single tiers of data that use columns. Managed metadata columns is a type of column that can be used and added to libraries, content and lists types which enables site users in SharePoint to select specific values from a term set of managed terms which can be applied to the site users content. Managed Metadata columns can be used to create a new term set or map existing term or term sets within SharePoint. (support.office.com) In addition to the simple traditional method of classification, SharePoint also adds more advanced metadata and taxonomy capabilities into their system. The driving force of the advance capabilities is the Managed Metadata Service, which is a centralized feature which allows organizations to share multi-tiered, formal taxonomies and multi-faceted structured across the entire organization.) The Managed Metadata Services feature can manage and support all types of taxonomies and folksonomy capabilities. (Stover & Bordner, 2011)
It is worth mentioning to increase the understanding of the subject that taxonomies are created to be centrally managed and constantly applied to content while other types of taxonomies such as folksonomies are about categorizing content using by the users. Folksonomies is a type of taxonomy that allows organizations to crowdsourc its taxonomy and let the users determine how content should be classified. (Ibid) The term “folksonomy” is a combination between two words, namely “Folk” and “Taxonomy”. These two words describe a social classification phenomenon. Folksonomies enable a social association between pages and users through social annotations. (Xu et al., 2008) Folksonomies are composed of keywords or tags that are freely selectable. These keywords and tags can freely be attached to any kind of information resource and can be seen as “electronic post-it notes”. Objects can have more than one tag and these tags can be reused to several objects in SharePoint. Folksonomies does not consist of any type of hierarchy as all tags have no relationship between them and are seen as equal to each other. The tags that exist in folksonomies are not pre-defined, they are created as by users as they use SharePoint. When a user has added a tag to an object it is added to a list, which can be reused. The list therefore continuously increases in size as users use SharePoint. Folksonomies can be seen as traditional taxonomies, with the difference as being informal. When compared to traditional taxonomies, folksonomies can be considered as confusing and chaotic but it has proven it success in different internet services, such as Flickr. The reason for the success is because folksonomies are easy to understand and it takes no time to tag objects to structure information. There are also no pre-defined hierarchy such in traditional taxonomies which can limit an organization’s vocabulary. The metadata management service in SharePoint have the feature of using enterprise keywords and social tagging. (support.office.com; Peters, 2009; Sharepointsharon.com)

Keywords can be used to describe and tag any type of content such as documents, images, video and pages. Users can choose to make keywords private or public which is a feature that allows content to be hidden if necessary. This is important when having classified information within SharePoint (Ibid)

In SharePoint content management and taxonomies is considered an important aspect and the software therefore has many different kinds of features concerning these areas. Features such as metadata-driven navigation, keyword Suggestions, metadata-driven search refinements, note board, notes, document sets, content organizer, recent authored content, multistage disposition, unique document IDs, workflow templates and more. (Stover & Bordner, 2011)

With the managed metadata an organization can use metadata and share content in its business across several web applications and site collection. (technet.microsoft.com, 1b) In SharePoint it is possible to organize metadata centrally and organize and customize it depending on the business and make content easier to find in the jungle of information. (support.office.com)
SharePoint offers large amount of flexibility regarding metadata within organizations. An organization can choose the level of control and structure of metadata and the scope of control and structure. (support.office.com)

- It is for example possible with metadata management in SharePoint to make specific to local sites and apply control globally across several sites. (Ibid)
- It is possible to configure term sets to be open or closed for contribution by users. (Ibid)
- It is possible to use social tagging and enterprise keywords with managed terms or not. (Ibid)

![Figure 6: Connection between different levels of control and scope in relation to an organizations different requirement.](support.office.com)

The diagram figure shows the connection between different levels of control and scope are related to an organizations different requirements. (Ibid)

In the following subchapter I will discuss the benefits of managed metadata and in which ways it can be advantageous for organizations using it.

2.2.8.1.1 Benefits of Managed Metadata Service

The Managed Metadata Service application can provide several different advantages for an organization and across its sites. (support.office.com)

One of the benefits is the **consistent use of metadata**. With the managed metadata feature an organization can control how its users add and use metadata to content in SharePoint. An organization can for example control which terms its users can add to its content by using managed terms and term sets. It can also control permissions and control which users that can add new terms. (Ibid)
When users within an organization consistently use the same terms across its site it is easier to create strong solutions and processes that are dependent on metadata. It also becomes easier for users of SharePoint to consistently add metadata to their content. (Ibid)

Another benefit of using managed metadata is the improved content discoverability. Content across sites in SharePoint that have consistent metadata can aid users to find data and business information by using the Microsoft SharePoint search engine. (Ibid)

A third benefit of using managed metadata is the increased flexibility. With managed metadata it becomes easier for administrators to adapt and maintain metadata as the business evolves over time. (Ibid)

Organizations using SharePoint have the possibility to receive the benefits of formal managed taxonomies combined with the dynamic benefits of social tagging in ways that are customized. It is therefore possible to mix both formal managed taxonomies together with folksonomies. (Ibid)

The following subchapter will explain the conceptual framework of the thesis. The conceptual framework has the purpose of putting the problem statement into a clearer context and making the overall thesis easier to understand.

### 2.3 Conceptual framework

Most research reports have some kind of conceptual framework which puts a problem statement into a context. (Chalmers, 1982). The benefits and purpose of a conceptual framework is that it explains the main components to be studied either in a graphical or narrative form. The main components can be for example constructs, variables, key factors and relationships among these components. (Miles & Huberman, 1994) A conceptual framework can assist to provide more clarity and identification of these research variables. (Chalmers, 1982)

In this paper I have chosen to use a figure of the creation of results by using ECM as a conceptual framework. The theories and figure are used by Sandvik, AIIM (Association for Information and Image Management) and Alavi & Leidner (2001). The reason to why I have chosen a framework which is based on the theories from AIIM is because Sandvik and its subsidiaries define their knowledge management and enterprise content management theories based upon the theories generated from AIIM and are therefore relevant in this study. Alavi & Leidner (2001) theories also acknowledges the core steps in the theory of AIIM. The theories of Alavi & Leidner (2001) explains the core processes of knowledge management within organizations and are very similar to the ones of AIIM. The processes are the creation, retrieving, storing, transferring and application of knowledge. (Alavi & Leidner, 2001).
This theory has also been chosen as a conceptual framework because it goes through each step that is necessary in order to structure and govern data within an organization such as Seco Tools and Sandvik.

The figure shows what ECM is and how results are created that benefit organizations in governing and structuring data within the organization. The figure consists of six steps and concludes to create results which provides better. I will below explain each step of the cycle:

1. Create – The first step of the ECM cycle is the creation of data. Data can be created by an employee or professional’s work. (AIIM.org)

2. Manage – The second step is the management of the data that is created by the user. To manage this data it must be managed somehow, with a system such as Microsoft SharePoint. The management step is important because it allows data to be found and lets whomever to use the data as it is intended. (Ibid)

3. Capture – The third step is the capture element. In this step ECM tries to capture the value that exists within the data. The capture step is therefore about capturing what that is of importance and what that can give value to the organization. (Ibid) This step is therefore about identifying, classifying and collecting relevant business content into the systems that an organization uses. (AIIM.org; Blair, 2004)

4. Archive – The fourth step is about archiving the information and knowledge that provides the organization with value. The reason why the information and knowledge is archived is because the organization may need it in the future so it is necessary that it is not thrown away and also because the organization wishes to follow compliance laws that exists. (Ibid)

5. Deliver – The fifth step is about delivering information and knowledge to the person that needs it with the right security permissions. The delivery method can be through Microsoft SharePoint or any other type of communications channel such as intranet, websites et .c (Ibid)

![Figure 7: What is ECM? (AIIM.org)](image-url)
6. After the five steps have been completed and successfully implemented within the organization results should be created. Results are created if a person within the organization is able to extract and gather important and relevant data from the enterprise content management strategies that an organization uses. (Ibid)
3 Research methodology
This chapter has the purpose of presenting the approaches that were used in order to gather information for this study. The chapter also justifies the choice of subject and organization followed by a description of the research preunderstanding, data collection methods and validity and reliability of this study.

3.1 Research approach
According to Bryman & Bell (2005) researchers can begin their research by choosing one of two approaches, which are the deductive and inductive approach. When these two approaches are combined into one, it creates a third approach called the abductive approach (Alvesson & Sköldberg, 1994). The abductive approach has been chosen in this study because it allows me to gain new knowledge of the chosen research question but also because I have prior understanding and knowledge of knowledge management and data management from my previous academic background.

If an author has the objective to identify and discover new facts and concepts such as relationships and variables then the abductive approach is beneficial. (Dubois & Gadde, 2002) Another benefit with the abductive approach is that the gap between the deductive and inductive research approaches is where new and exciting knowledge can be discovered. (Holme & Solvang (1997) To be able to find new and exciting knowledge is something that makes this thesis more interesting for the reader and myself. It can also benefit future academics, Seco Tools and Sandvik.

Empirical data has been gathered through different methods. One of the methods is semi-structured interviews. Semi-structured interviews occurs when the researcher has compiled a list with questions before an interview but during the interview it can vary depending on the interviewee and his or her response. (Saunders, Lewis & Thornhill, 2003).

When a researcher gathers empirical data to develop a theoretical framework for his or her study then it is called an inductive research approach. The theories in the theoretical framework consists of the investigation that occurs in the study. In order to use the inductive research approach the researcher that is conducting the study must have some kind of pre-knowledge and pre-understanding of the subject that is being researched. This is because it allows the researcher to commence the research with some knowledge. (Bryman & Bell, 2005). The deductive research approach is used if a researcher choses to use theories to develop their hypothesis. Another characteristic of the deductive approach is if empirical data is providing results which can confirm or reject the hypothesis. A third and last
characteristic is contribution to the results area of the theories which can be either a confirmation or revision of the original theories. (Bryman & Bell, 2005)

3.2 Choice of subject
Before choosing the subject of migrations and knowledge management within the IT sector I had discussed several other possible areas with Seco Tools that were possible to investigate in the field of computer science. I had several ideas to investigate areas within the realms of enterprise architecture, data management, business process reengineering, organizational use of kaizen and more. The idea of investigating data management and how Seco Tools manages their data within the organization originated from my prior work experience within the organization. I worked within the organization and noticed that the Lotus Notes groupware and other information channels had thousands of different documents and information. Relevant information was difficult to find in the jungle of information. Sometimes I would find the same type of information several times in different versions, usually only slightly different. I saw a lack of structure in how knowledge was managed. I noticed that this was a problem and a possible area of investigation.

3.3 Choice of organization
The reason to why I chose Seco Tools for my thesis is mainly because I worked within the organization and had an interest in the business. Seco Tools was also chosen because it is a global MNE, a large multinational enterprise which I believe gives me greater possibilities to understand the problems of migrations and knowledge management due to its size and global presence.

3.4 Pre-understanding
It is crucial in a study that is conducted to gather and establish knowledge in relevant literature. The reason for this is because it provides with the advantages of saving time by using existing research in a certain topic area. The building of knowledge is something that makes it easier for a researcher to understand a research problem through similar and existing research and related studies. (Ghauri & Grønhaug (2005)

The first step in a research project is to do a literature review which aids a researcher to find answers to their research question to some extent or at least gain more clarification of the question. One of the advantages of establishing and gathering knowledge in relevant literature is that a researcher better and more easily understand the information that is gathered to a study and this provides a pre-understanding of a researcher’s research area. (Christensen et al, 2010)
In order to prepare myself for this study I began to gather relevant information about the research area and the problem of Seco Tools in order for me to gain some pre-understanding. I have searched in a large amount of academic databases, books and scientific articles looking for relevant information. Since I am reading this course at Uppsala University, I have used databases available through the university website. Most of these databases are electronic but I have also used other databases available at other websites such as Google Scholar. The main database that I have used for this website is called “ProQuest”, which is a website that has allowed me to find scientific articles in relevant topics.

The keywords that I have used to find information in these different databases have been “knowledge management, content migration, content management systems, information governance, content management and metadata”. I have discovered that these keywords have helped me find relevant information in the different databases.

3.5 Data collection
Ghauri & Grønhaug (2005) explains that data or information can be classified into two types. The two types are primary and secondary data. These types of data can be found strategically or randomly depending on the channels and research approaches. In studies that conduct quantitative methods data can be found randomly by randomly selecting participations in questionnaires. In qualitative methods, a researcher can be strategic by carefully choosing respondents which can help them to find the most important information available. (Ibid)

3.5.1 Primary data
Malhotra & Birks (2003) mentions that primary data is information that is gathered by a researcher which allows them to answer the research question and research problems of the study. When conducting interviews there are two types of interview categories that can be chosen according to Sekaran (2000), namely structured and unstructured interviews. A structured interview is conducted through a so called interview schedule. An interview schedule usually contains pre-determined questions that are created before the interview and which can help the researcher to control the structure of the interview when it occurs. If an interviewer or researcher leads with questions or gives topics during the interview that the interviewee discusses and answers then the interview is unstructured. These unstructured interviews are characterized by the fact that their topics and questions are not structured and this is something that allows an interviewee to discuss more freely around a certain topic. (Bryman & Bell, 2005; Ghaur & Grønhaug, 2005)
3.5.1.1 Interviews
In this study I have made interviews with employees within the Seco Tools organization’s IT department and Sandvik IT department in order to gather relevant and important data. The reason to why Sandvik employees have been interviewed is because Seco Tools is a subsidiary to Sandvik and is as a result bound by the rules of Sandvik to some degree. The interviews that have been conducted in this study have been semi-structured. According to Saunders, Lews & Thornhill (2003) semi-structured interviews occurs when a researcher has compiled questions that needs to be answered by the interviewee but that can change depending on what the interviewee says. Using a semi-structured approach during interviews contains several advantages. The advantages is that relevant information that is needed to answer a study’s research question is gathered through a structured approach. In addition, the interview questions can be adapted depending on the answers of the interviewee which allows the interview to be flexible. Another advantage of semi-structured interviews is that it allows interviewees to answer within the field of study and at the same time answer more freely. This combination increases the chance that the answers that the interviewees gives are relevant. (Bryman & Bell, 2005) Semi-structured interviews also have some disadvantages with its approach. One of the disadvantages is that it is highly dependent on the interviewer and its skill to lead the interviews. If an interviewer is not skilled enough then there is a possibility that certain relevant topics and subjects can be missed. (Patton, 2002).

The interview questions that were used during the interviews are attached and can be found in the appendices chapter. The questions that can be found in the appendices chapter were prepared before the interviews were conducted. In each interview the interviewee always had the possibility to express him/herself which helped provide the study with relevant information. By letting the interviewees freely express themselves short answers such as yes and no could be avoided for the majority of the questions. When a yes or no answer was given I would always try to let the interviewee to develop their answers with the purpose of gaining more information.

As a result of the interviews being semi-structured the interviews were not strictly bound by the prepared questions. Sub-questions and new questions arose naturally during the interviews because I tried to gain more information about the primary questions. A total of four persons were interviewed from both Seco Tools and Sandvik. Some interviewees were interviewed more than once in order for me to gather as much data as possible and to increase the reliability of the answers that I have received. The interviewees all held different positions within the organizations. One interviewee was an IT demand manager from Seco Tools, one information controller from Seco Tools, one IT manager
from Sandvik and one enterprise content manager from Sandvik. The titles of all interviewees and the date of the interviews can be found in the appendices chapter at the end of this study.

3.5.2 Secondary data
Malhotra & Birks (2003) explains that secondary data refers to data that have been gathered by other researchers and that have a different purpose than that of the actual study. Secondary data can provide a researcher with several types of benefits. The primary benefit of using secondary data is that a researcher can save resources and time by not having to collect and search for data themselves. Instead researchers can invest their saved time by finding relevant information by other researchers from internal and external documents. (Bryman & Bell, 2005; Ghauri & Grønhaug, 2005)

3.5.3 Qualitative approach
In order to gather and find information it is possible to use one of two different approaches, namely the quantitative approach and the qualitative approach (Andersen, 1998). For this study I have chosen the qualitative research approach because it can provide an analytical view regarding knowledge management and migrations in Seco Tools. In qualitative research approaches the main focus is on words and text, opposed to the quantitative approach with is based on numbers and sums. (Bryman & Bell, 2005) Bryman (2002) explains that the main difference between the qualitative and quantitative approaches is that the quantitative approach usually use a large amount of respondents while the qualitative approach usually focuses on a smaller group of respondents. In this study a large amount of interviewees are not necessary to answer the research question and thus the qualitative approach has been considered the better choice.

3.6 Validity and reliability
When using qualitative approaches two terms are often discussed, i.e. validity and reliability. Many researchers today are diagnostic when using their approaches and they find using these terms important when it comes to qualitative approaches. These terms can help and provide researchers show the quality of a study. When a researcher conducts qualitative research he or she must discuss the reliability and authenticity of the study. The reason for this is because qualitative research often does not result in solely one truth. (Bryman, 2002)

In the term of reliability the concept of authenticity is included were the result that is obtained by a researcher is considered reliable in the study. Authenticity is related to the research that has been conducted and this should give an unprejudiced representation and provide participants in the research with support. (Ibid)
The reliability of this paper is high because if other researcher wished to conduct this study once again then it would be easy to replicate the methods that were used. It is for example easy to replicate the interview questions because they are clearly presented to the reader and other researchers can easily use the same questions. In addition to the replication possibilities, references can be found throughout the thesis and this provides the reader to easily find for all information that was written. (Saunders, 2003)

When a researcher desire to have a high level of validity in his or her research then the information that have been gathered must be of interest to both the researcher and to the focus area. As a result of having structured and relevant interview questions for the study, the validity increased in this paper. (Ibid)

The issues of ethics in research is something that a researcher cannot neglect and the ethical aspects is something that exists in different stages in a study. As a result of these ethical factors a research process and its aspects such as confidentiality, plagiarism, objectivity and openness have to be taken into account and be treated ethically throughout the study. (Bryman & Bell, 2011) While working in this study I have tried to be thorough in giving comprehensive information of the chosen methods, processes and limitations. This study has tried to provide the reader with references which are easy to follow throughout the study.
4 Empirical findings

The empirical findings chapter has the purpose of presenting the background information of Seco Tools, Sandvik and information obtained from the interviews. The interview questions can be found as Appendix 1-4 at the end of this paper.

4.1 Knowledge and content in Seco Tools and Sandvik

The IT demand manager of Seco Tools, Anders Dahlberg (2014), and enterprise content manager of Sandvik, Ann-Cathrine Ekberg (2014) explain during the interviewees that there exists different types of information and that all information that exists within the Sandvik and Seco Tools organizations are not seen as equally valuable. Some information is considered more important and valuable than other types of information because it can provide greater value for the organization. Within the Sandvik organization, there are four types of knowledge types, namely “noise, data, information and content”, see figure 8 on the next page.

Data and noise are usually something that consists of large amounts of numbers and calculations. This type of information does not have any kind of context. These type of information does not provide value to Seco Tools and Sandvik as it is seen as “noise”. It does not have any type of context which results in that it is difficult for employees within Seco Tools and Sandvik to use it in a way that gives value to the organization. Data and noise exists within Seco Tools and can be created from e.g. internal sources such as employees work where a context has not been set or deriving from external sources outside the organization. The reason to why data and noise exists is because the organization is reluctant to remove it as it thinks that it can be used somehow in the future. (Dahlberg, 2014; Ekberg, 2014)

Information can be information that exists in e.g. presentations and text files that could be important but that is not structured and therefore does not give any value to any employee within the organization. This type of knowledge is not easy to find and are not seen as important compared to content. (Ibid)

Content is when information has value and has a belonging within the organization. For example a result statement, budget forecast or production statistics could be examples of content within Sandvik. (Ibid)

The primary task in the new content management system is to be able to structure information that has value for the organization and the employees. Data and information are also important for the organization but the main focus is to be able to structure content with the purpose of allowing all
employees finding the information that is relevant and has value to their work. When information moves higher in the hierarchy which can be seen in figure 8, the more value it provides to the organization and business. As that can be seen in figure 8 on the next page, the higher in the hierarchy, the less waste and more purposes are found for the information.

In the migration from IBM Lotus Notes to Microsoft SharePoint it is as therefore important that valuable information is migrated and that “waste” and “noise” information is filtered. (Ibid)

![Figure 8: Types of knowledge in Sandvik. (Own illustration of Sandvik figure)](image)

The enterprise content manager interviewee Ekberg (2014) explains it is important that employees within the organization are able to share knowledge with each other so that it can be found. A common problem that exists within the organization is that many employees have the misconception that their work is classified and should be kept secret from most other employees. Often the information that is created in the organization needs to be shared so that other employees can find relevant content and critical information. However in the organization there exists information that is centralized. With centralized it means that the information is strictly prohibited to outside parties, this could be e.g. balance sheets or other critical information. Much of the information in the organization is also decentralized, which means that e.g. the IT department controls the security and classification of certain IT documents. (Ekberg, 2014)

4.2 Strategies to govern information

One of the interviewees, Thomas Persson (2014) explains that Seco Tools perspective on information management is the following:
- It gives a key resource to the organization just as employees, products et c.
- Information that is created has a high value and needs to be cared and managed.
- Information that differs between systems can cause problems both internal and for customers.
- It provides reliability and accuracy of information.
- Makes business change initiatives easier.

Persson (2014) explains that there are three concepts in the terminology of information management at Seco Tools, namely governance, compliance and maintenance. Governance is when you create laws, policies, strategies which must be followed. Compliance is about making sure that the governance is followed properly within the organization. Maintenance is about understanding the law and making sure that it is followed. (Persson, 2014)

Sandvik and Seco Tools have clear definitions on the meaning of enterprise content management (ECM) within their organizations. According to the Sandvik enterprise content manager Ekberg (2014), the definition of ECM is the following:

“The strategies methods and tools used to capture, manage, store, preserve and deliver content and document related to key organization processes”. (Ekberg, 2014)

Ekberg (2014) explains that the ECM definition can be applied regardless of which system that is used, i.e. being platform independent. The ECM strategies of Sandvik refers both to the strategies and tools used to manage information. ECM supports business needs and easy sharing of knowledge and critical information. In the Sandvik organization, critical information refers to the information that is very important and value adding. Critical information can depend on the departments of the organizations. For a finance department, invoices and balance sheets can be examples of critical information while for e.g. IT, marketing, production and HR departments it can be other types of information that is considered critical. The ECM strategies in Sandvik applies to the information that is important and critical for the organization. Information that is not considered important is seen as “noise” and should not be regarded necessary to structure as critical information. Information that lacks importance can be stored anywhere and in any way the user wishes, because it have no significance for the ECM strategies of Sandvik. This kind of information is seen as “data”, information without any type of context and can be stored for example locally on each employee’s computer. Data may lack context but if one is found then it can be useful and valuable. As a result of this, data exists and is stored.

Which and what kind of information that is important for a certain subsidiary within the Sandvik organization is up to each subsidiary to decide. (Ibid) The IT demand manager Anders Dahlberg explains that it is difficult to know what kind of information that is “critical” and gives “value” which
Sandvik describes. Anders explains that it is important that all information is structured and migrated to Microsoft SharePoint because it is difficult to pinpoint what that is important and what that is not. The only exception of information that should not necessary be managed is information that is stored locally on employees computers. This is seen from the perspective of Dahlberg (2014), however Seco Tools should follow the guidelines of Sandvik as it is a subsidiary. (Ekberg, 2014)

In the next section I will give information of how Seco Tools and Sandvik views ECM within their organization and how it works.

4.3 Enterprise Content Management

ECM has the purpose of addressing how information should be created and managed within the organization. Content needs to be governed and managed in order for it to be used effectively to achieve business goals. ECM also supports Sandvik and its subsidiaries by allowing and making it easier to share knowledge and critical information that adds value. (Ekberg, 2014)

Figure 9 shows the strategies, tools and methods of ECM are used to capture, manage, store, preserve and deliver content and documents related to key organizational processes. (Ibid)

ECM focuses on non-numeric content which is textual content and not numbers which can be calculations or spreadsheets. ECM has the purpose of governing these non-numeric contents which can be documents, spread sheets, web pages, diagrams and images. When ECM is successful, then the content becomes structured, and will be stored in databases and tables found in i.e. information systems that Sandvik uses. ECM is considered very important because 85% of all documents are never retrieved, 60% of all documents are obsolete and 50% of documents are duplicates. Documents are also costly as they cost 15 percent of annual revenue of organizations according to Sandvik. (Ibid)
4.3.1 Enterprise content management governance

Figure 10 shows what kinds of properties that ECM consists of in Sandvik and its subsidiaries. The first element shows governance. ECM in Sandvik is seen as important, but it needs to be managed and governed. Because of a need of management and governance of ECM, Sandvik is setting strategies, policies and guidelines that helps the organization regarding ECM and how data should be structured. All these strategies, policies and guidelines is what that governance consists of and is the core of enterprise content management in Seco Tools and Sandvik. (Ekberg, 2014)

Sandvik follows common and general rules regarding governance, which can be found at other organizations as well. The purpose of having rules and a governance structure within the Sandvik organization is because Sandvik wishes to follow common laws and decrease corporate risk. With governance Sandvik can support compliance with regulatory, legal and other types of business specific mandates which demands security and records management. With governance Sandvik is able to control accessibility and security of its content. This can be for example controlling which person that is allowed to update, read, delete and create documents. With governance content integrity is created. This means that Sandvik has the possibility of providing security, records management and versions to ensure that its content is correct and up to date. Governance makes it easier to support external exchange of information with partners, providers and customers. Lastly governance allows content to be reused. This can be done by publishing content to various media channels at the same time. Sandvik and Seco Tools hopes that a strong governance structure will allow all employees to be able to find
and share information that they need for their daily work when they need it and be sure that the content that they are using is correct. (Ibid)

Sandvik is currently in the process of developing its governance structure with its documents, policies, guidelines and strategies but have not finished completing them yet. A **policy** is a steering document that Sandvik works with. It provides employees with rules and structure regarding how information should be managed and structured. It can for example provide employees information about which metadata criteria documents should possess. The purpose of the policy is that it should be general. This means for example that employees within Seco Tools should read the policy and implement it in its organization, but be able to customize it after its own organizational needs. This means that there exists a general template for all subsidiaries in the Sandvik organization, but each subsidiary can customize the policy regarding ECM after their needs so that it becomes as efficient as possible. For example if Sandvik has ruled that certain metadata criteria should be included in documents then it must be included in the documents of Seco Tools. If Seco Tools becomes aware of a need of additional metadata criteria in order to find relevant information, then it can accumulate further metadata criteria. However, Seco Tools cannot discard the criteria set by Sandvik. Thus it is important that the structure of information should follow the rules of Sandvik but also Seco Tools own criteria. The metadata criteria set by Sandvik will be discussed later in this chapter. (Ibid)

**Strategy** is about the strategies within Sandvik IT and the whole organization and that they should work well with each other. (Ibid)

**Guidelines** are instructions of how employees and other professionals should follow the policies. (Ibid)

The second element shows **“Search - Findability”** This step exists to ensure that each staff or professional working within the organization can find their relevant information when using the different types of information systems of Sandvik. A staff member must be able to find information that is relevant to his or her work in order to contribute to the business. (Ibid)

**Collaboration** is the third element and exists to ensure that collaboration between the employees within the organization is done properly. This step is important as employees must be able to cooperate and share information with each other. Collaboration also ensures that data is stored and managed properly and that data is not lost on servers that only can be accessed locally. Collaboration can for instance be that documents contain certain metadata criteria which makes them easy to find and so that employees upload content instead of storing it on their computers. Collaboration can also be defined as “openness” in which employees are open and trusting of each other when it comes to sharing information. (Ibid)
Archiving refers to the archiving of documents and other types of content within the systems that Sandvik use. This element is important because it allows Sandvik to save important content into the future. (Ibid)

The archiving process of information is something that is planned to be automated within the new CMS. In Microsoft SharePoint there are functions available that makes it possible for a user to set e.g. a certain type of document to be archived. This is possible as a metadata criteria when creating said document. (Ibid)

Document types which is the last element shows what kind of information types that Sandvik can be structuring within its organization. Normal types of information types can be documents, e-mail, web content, intranet and other types of digital assets such as audio files and pictures. (Ibid)

There should not exist a considerable amount of focus on permissions of documents and applications when migrating to Microsoft SharePoint according to Dahlberg (2014). Seco Tools does not want to focus on implementing many different kinds of security permissions that restrict access to content as they believe that it will be a disadvantage for the organization. If there exists too many types of permissions which restricts read access then the flow of information within the organization becomes limited. There should nevertheless exist some kind of basic security permission criteria for sensible information. (Dahlberg, 2014).

4.3.2 Metadata
In order for Sandvik and its subsidiaries to find relevant information it is important that they set metadata criteria, making documents and other types of information easy to find. Metadata also provides and makes it easier for employees to find content that has value for their daily work. (Ekberg, 2014)

Sandvik has set a metadata criteria template for finding information in their information systems. The criteria is shown in figure 11:
Ekberg (2014) explains that the metadata criteria shown in figure 11 are going to be used as a template and foundation for Sandvik and its subsidiaries. The above metadata criteria is therefore a template that is implemented in Microsoft SharePoint as a minimum requirement when creating information in e.g. SharePoint. This means that if a user wishes to create a document within Microsoft SharePoint or import e.g. a document then the user must fill in the necessary metadata information. The metadata criteria that needs to be filled in manually by the user are security classification, document type and date for review / retention period. The reason to why these metadata criteria needs to be filled in manually is because it is difficult in Microsoft SharePoint to know the right values and settings for these factors. When there are thousands of documents it is impossible to set a general security classification for all documents as some documents needs to have restricted access as a result of their content. It is also difficult to set predefined date for review and retention periods for documents before they are created. For these manually entered metadata it is the user’s responsibility to set the right and correct data. (Ibid)

The other remaining metadata criteria, i.e. “title, created by, creation date, document owner, document /object ID and version” are automatically created when a file or document is created in the system but can be changed manually if necessary. (Ibid)
If a subsidiary like Seco Tools wishes to add further metadata criteria, then they can do so in order to make content easier to find and more accessible. The reason the metadata criteria is only a template is because all subsidiaries do not operate in the same area of business. Some businesses require different kinds of metadata because of their business operations require them to do so. Seco Tools are for example active in different manufacturing operations than other subsidiaries which may result in a need to use other type of metadata. Cemented carbide tools for inserts are manufactured by Seco Tools and its production department might need special metadata criteria while other subsidiaries have metadata criteria for other types of manufactured products. (Ibid)

In addition to metadata, Sandvik has decided that documents should be structured and put in certain document types so they are easier to find. The document types are the following: contract, correspondence, decision, guidelines, presentation, Item/case, minutes, offer, order, order confirmation, plan, policy, procedure, report, specification/description, verification/certificate. These document types are set in the guidelines, regardless of which system that is used. If Seco Tool wishes to use other kinds of document types, then they can be applied. (Ibid)

Figure 12 shows an invoice application that Seco Tool uses. This figure illustrates an example of real use and importance of using metadata. This application is used to find invoices. In order to find an invoice a user is required to type in certain metadata. For example “Lev.nr” means supplier number. If a user types in a certain supplier number, for example “55173” then the system will find the invoice containing this metadata. Seco Tools does however have not set any requirement in Lotus Notes or
any other system regarding metadata for e.g. data and documents. A user can create a document without manually setting any type of metadata. Documents that are created in Seco Tools Lotus Notes environment usually have basic metadata automatically created by the system such as creation date and author but not much else. (Dahlberg, 2014)

4.3.3 Taxonomies
Currently Seco Tools does not have any type of strategy in how information should be classified or managed in Microsoft SharePoint. In Lotus Notes there does not exist any type of taxonomy. Information is stored in different databases and applications that are chaotically placed in the system. When installing Lotus Notes, users only have access to a few databases and applications. In order to find other databases and applications one needs to receive a link. This makes information difficult to find as there can exist databases and applications that are relevant for a user but that the user cannot see because of missing links. (Malmström, 2014)

In the local windows environment however there exists some classifications for each department. When employees within the marketing department e.g. wants to upload information that is related to their department they need to enter their department “folder” or “database” and insert it there. In the marketing department folder there exists sub-classes or “sub-folders” in which the employee needs to find the right place to place his or her information. The structure of each department database is set by the departments themselves and the structure of each database can look different depending on department. This can be seen in figure 13. (Ibid)

Figure 13: Simple illustration of a marketing taxonomy. (Own illustration)
The IT demand manager of Seco Tools, Anders Dahlberg (2014), explains that the classification of information and documents within the organization can be complex. In Seco Tools there exist information that can be classified by several types of criteria and include different concepts, and not solely consisting of one of these described. The classification and taxonomy structure is complex because if an e.g. document that is classified as both IT and Finance, where should it be put in Microsoft SharePoint? A document that is both IT and Finance related can be for example the Seco Tools IT budget balance sheet, which contains interesting information for both the IT and Finance departments. The document is not completely IT nor Finance and is therefore a problem that needs to be solved.

4.4 Migrating to Microsoft SharePoint

4.4.1 Issues with the migration

Seco Tools is currently in the phase of planning to migrate information from IBM Lotus Notes to Microsoft SharePoint. The date of the migration to Microsoft SharePoint has not yet been determined but it is estimated that it will occur sometime in 2015 or 2016. The migration to Microsoft SharePoint brings problems to Seco Tools as the information needs to be structured somehow and there does not exist any current IT strategy set in how to conduct this migration. (Dahlberg, 2014)

Figure 14: Migration from IBM Lotus Notes to Microsoft SharePoint. (Own illustration)

Figure 14 shows a simple illustration of how the process is likely to look like when moving from IBM Lotus Notes to Microsoft SharePoint. From IBM Lotus Notes, Seco Tools will migrate both applications and data to its new CMS Microsoft SharePoint in the form of documents, presentations, reports, digital assets et c. After the information has been migrated, it should be easily accessible by users at their fingertips. (Ibid)
Dahlberg (2014) explains that Seco Tools currently does not have any strategies in structuring information within their organization and that this problem area is a completely new for them. In their current groupware system IBM Lotus Notes, documents and applications do not have any specific metadata criteria and are not managed with any structured method. Seco Tools have therefore found it necessary for them to set some kind of structure to manage and govern this kind of information. I have together with Dahlberg (2014) discussed some methods of structuring information through taxonomies which makes it easier for users of Microsoft SharePoint and other information management systems to find their information but any kind of method or taxonomy do not currently exist. In the current IBM Lotus Notes environment when information is created (see figure 7 & 9, What is ECM?) employees insert the information in the system in applications/databases. When employees insert information they are not required to set any kind of metadata criteria such as title, document owner, document type and security classification. When an employee creates e.g. a document then only a few selected metadata criteria are created automatically, for example that the document is created by said employee, which time it was created et c. It is possible to add more metadata criteria, such as who that is the owner of the document which makes it easier for other employees to know who that owns it and who they should contact if they have any questions, and it is also possible to add tags and security permissions. However if one wishes to add a security classification for a number of documents then it must be done for each document separately, which can take a lot of time and increases the chance of typing the wrong metadata. (Ibid)

As a result of the migration to Microsoft SharePoint being a new problem area for Seco Tools there does not exist any strategies in how the information should be transferred from IBM Lotus Notes to Microsoft SharePoint. (Ibid)

4.4.2 Strategic IT advantages with Microsoft SharePoint

Sandvik and Seco Tools are part of the same organization and have therefore decided to use the same kind of tools and software when it comes to their work processes and workflows. Sandvik has decided that it is important that all subsidiaries within the Sandvik organization use the same software and tools to increase the efficiency of all kinds of work processes. The migration from IBM Lotus Notes to Microsoft SharePoint comes from this Sandvik concept, that all subsidiaries and the parent company should use the same tools and software. (Malmström, 2014)

Magnus Malmström (2014) who is an IT Manager explains that one of the reasons to the migration to Microsoft SharePoint were mainly because of strategic significance. Microsoft SharePoint has been chosen because Sandvik has regarded it as a software that has a leading position within its area of use. Several of the interviewees also mentioned that IBM Lotus Notes is a software that is fading and is
used less today. Microsoft SharePoint has become a more common knowledge management tool and this is one of the reasons for choosing Microsoft SharePoint. Another reason to why Microsoft SharePoint was chosen was because it is easier to find developers for Microsoft SharePoint than IBM Lotus Notes. Sandvik has been looking at other type of CMS such as EPiServer but chose Sandvik because of strategic importance. The strategic importance is for example that it is easy to find programmers who can develop applications and the system. Comparing Microsoft SharePoint to IBM Lotus Notes it is much more difficult to find developers that can program using IBM Lotus Notes because it is an aging and fading software. As a result of IBM Lotus Notes being a fading software the few developers that exists are much more expensive to hire than Microsoft consultants. Microsoft SharePoint therefore has the strategic advantage of being much cheaper and more reliable in finding developers. (Malmström, 2014; Dahlberg, 2014).

Another advantage of using Microsoft SharePoint over IBM Lotus Notes is that there exists many software solutions available to organizations such as Application Programming Interfaces (API). In IBM Lotus Notes there are less solutions available which results in that solutions need to be built from scratch which can be expensive and time consuming. (Malmström, 2014)
5 Analysis

This chapter will answer the study’s research question based upon the results obtained from the empirical findings and the secondary data in the theoretical framework.

In the following subchapters I will analyze how Seco Tools can migrate and govern its information while using the ECM cycle which was presented in the conceptual framework in the theoretical framework and the empirical findings chapters. I will also analyze and discuss different migration and governance strategies that Seco Tools can implement in its migration to Microsoft SharePoint.

The following subchapter will discuss the first steps of the ECM cycle, which are the creation and management of information. The subchapters will explain why understanding knowledge and content is important in an ECM cycle in order to create results.

5.1 Knowledge and content in Seco Tools and Sandvik

Knowledge and content in Seco Tools and Sandvik are created by the employees within the organization and through external sources outside the business. The first element of the ECM cycle, which can be seen in the conceptual framework in the theoretical framework, is the creation of data. (AIIM.org; Blair, 2004) Knowledge and content must according to the interviewees in Seco Tools be structured and governed in a way that makes it easy for a user to find relevant information for their daily work. The accessibility of relevant information within SharePoint must be good in order for the migration to have been successful. However, Seco Tools does not have any type of governance and structure of information. This is problematic because Seco Tools has planned to migrate large amounts of information to a new CMS. (Dahlberg, 2014)

If Seco Tools wishes to set management and governance strategies it needs to understand what it considers to be valuable information, knowledge and content. This is because information, knowledge and content are vital parts of knowledge management. (Brelade & Harman, 2003; McInerney and Koenig, 2011) Since the creation of information is the first step of the ECM cycle it is therefore important that the definition needs to be understood before conducting the migration to SharePoint. (AIIM.org) The first step of migrating information to SharePoint is hence understanding the information and content that is being migrated from Lotus Notes. Seco Tools should classify their information into different categories such as data, information, knowledge and content. The reason why a classification of information is needed is because it allows the separation of critical information and information that is seen as noise. With this separation it becomes easier for Seco Tools to extract valuable information. By doing a classification Seco Tools can also follow the strategies done by Sandvik.
which also classifies their information and knowledge types, as that can be seen in figure 8 in the empirical findings chapter. I believe that a classification and definition of information is important also because it assists in the second ECM step, i.e. the management of information. As that can be seen from the theories from Brelade & Harman (2003) and Ragab & Arisha (2013), if Seco Tools is able to understand its data and information then it is able to put it into a context which makes it useful. The classification of information is therefore important because it allows Seco Tools to understand what that is important, valuable for the organization and which information that is not valuable as a consequence of a lack of context. Understanding information and its context is therefore the key to classifying information and separating critical information from the noise.

The value of understanding information and knowledge is important, as that can be seen in figure 1, in the theoretical framework chapter and in figure 8 in the empirical findings chapter. These figures show that the value of information increases in proportion to its level in the hierarchy. At the top if the hierarchy there is “Content”, which is the most valuable and critical information that an organization can possess, as it is fit for a purpose and put into a context which it is understood by its users. In order to reach content, one must first understand what that is considered as noise (i.e. information that does not have any context or purpose), so that it can be removed or filtered. Much of the information that is created can become noise if it is not governed properly, stored in the right place, not given proper metadata and not findable by a user. (Ekberg, 2014; McInerney, 2002; Brelade & Harman, 2003; Ragab & Arisha, 2013)

Sandvik have certain perspectives on what that is classified as knowledge and content while Seco Tools have other views. As can be seen from the empirical findings, interviewees Anders Dahlberg (2014) and Ann-Cathrine Ekberg (2014) have different views on information that is considered “critical” and value adding to their businesses. When analyzing the theories made by the researchers Brelade & Harman (2003), Ragab & Arisha (2013) and Cameron (2011), it can be concluded that is indeed difficult to pinpoint information that is considered important and which that is not. Cameron (2011) mentions that there is a correlation between quantity and quality when comparing data, information and knowledge in which he explains that there is a large size difference between these types of information. It is possible that Seco Tools migrates solely the information that it classifies to be of high quality that is critical and provides value. This however generates a possibility that information that was considered to be of low quality to be lost when it in fact was of high quality but lacked the proper context and understanding. It is better from a strategic perspective to migrate all or at least most information from Lotus Notes regardless of which level of quality it is considered as. This is because it reduces the risk of losing information that can prove valuable to the organization. When information is migrated it can be discussed within the organization if it should be archived, removed or used
somehow. The discussion within the organization should be conducted by each department and not be centrally managed. It is beneficial to empower the employees in each department as they have strong understanding of their information and applications. During the migration of information Seco Tools should consider allowing each department to be responsible for the migration of their information to SharePoint. By allowing the employees and departments to take responsibility there is a greater possibility that information that is considered unnecessary to be removed. The reason for this is because the employees of Seco Tools are the ones that possess the knowledge of what that is considered important and what is not. Seco Tools should therefore see their employees as intellectual capital that can be used for their collective and individual knowledge, abilities and skills. (Brelade & Harman, 2003; Ivana, 2010) A strong understanding of knowledge and content also allows for a better migration to Microsoft SharePoint as it becomes easier to decide how the migration should be conducted. As explained in the theoretical framework, an organization such as Seco Tools can migrate to e.g. standard lists, document libraries, wiki pages and other general methods. Understanding knowledge and content therefore gives Seco Tools a better understanding of which method(s) that should be used. (Walch, 2011; Bisbal et al., 1998; Wilson & Van der Beken, 2003)

The concluding remarks for this subchapter is that the understanding of information adds value to Seco Tools in the first steps of the ECM cycle, namely the creation and management of information. It is important that both the parent company Sandvik and subsidiary have similar views so that they work in a similar manner since they are part of the same organization. Päivärinta & Munkvold (2005) discusses that the foundation of any ECM solution is to understand content and which role it has within the organization. With the same views, definitions and understanding of information and knowledge as Sandvik it is easier to work together and grasp the creation of information in the ECM cycle and as a result easier to proceed to the second step, namely the management of information. With an understanding of the creation of information it becomes easier for Seco Tools to structure its information as it can easier put it into context. Which party within the organization that decides what that is considered important should be decided by Seco Tools, but I recommend empowering each department to decide what they consider important in their departments because as explained earlier, it is the employees that possess the knowledge and skills. Each department can nominate a content owner which is responsible in deciding which information that is considered important. The result of having the same definition and understanding of knowledge and content also allows Seco Tools to have a better focus in its migration if it chooses to migrate only what it considers important.

In the next section I will go through the strategies which Seco Tools can use to manage, capture and govern information in its new CMS. This are the management and capture steps in the ECM cycle. Later in this chapter I will discuss the issues that can occur with the migration to SharePoint and what Seco
Tools must think of before conducting their migration. Subchapter 5.2 Strategies to govern information will also discuss the archiving step briefly and how it can be automated in Microsoft SharePoint.

5.2 Strategies to govern information

As that can be seen from the empirical findings, Sandvik is in the process of setting numerous rules, strategies, guidelines and policies so that it and its subsidiaries easily can find and manage information, regardless of which platform that is used by the organization. This means albeit the current migration is to Microsoft SharePoint, the structure and governance strategies are general and compatible to be implemented in future migrations to other systems and platforms than Microsoft SharePoint. Seco Tools however does not have any type of strategy, rule, policy or guideline in how to migrate their information from IBM Lotus Notes to Microsoft SharePoint. Through a strong ECM and KM strategy, Seco Tools can provide its organization with a structured migration to Microsoft SharePoint and governance in the new system. ECM should be seen as a methodology and a strategy within the organization, which is what Seco Tools needs and lacks at the moment. Seco Tools also lack knowledge sharing practices and value systems often found in KM which is something explained by Ringel-Bickelmaier & Ringel (2010). ECM and KM are important aspects within large organizations such as Seco Tools because it allows the organization to connect the right information to the right person. (Brelade & Harman, 2003)

A recommendation to Seco Tools is that since it is a subsidiary of Sandvik it has the advantage of being able to use and mimic much of their strategies, rules, guidelines and policies and adapt them to their own business environment, which is exactly what Ekberg (2014) explains in the interviews. I believe that the best solution for Seco Tools at the moment is to use the resources that they have available for them, which comes from Sandvik. These resource are for example the ECM cycle, metadata templates and information structuring policies that are currently being created by Sandvik. These resources are beneficial and can assist and improve Seco Tools regarding ECM. As that can be seen from the theoretical framework and empirical findings chapter, Sandvik is using ECM theories which closely resembles theories and research conducted by researchers. (AIIM.org; Alavi & Leidner, 2001; Blair, 2004) This supports that the strategies, rules, guidelines and policies are beneficial and have academic foundation. Another reason to why I believe that it is good for Seco Tools to use Sandvik resources is because it saves them time, resources and also makes the governance and structuring of information easier because much of it is already made or is in the process of being created. From a strategic perspective it is therefore beneficial. Using the same strategies with Sandvik also allows Seco Tools to be “on the same page” as Sandvik regarding how information is managed and governed within the organizations. Sandvik is also the parent company of Seco Tools which makes it difficult for Seco Tools
to set their own separate and unique types of strategies. The strategies and resources from Sandvik are however general, and Seco Tools should can improve them for its organization by customizing them to their specific business environment. This means that they should not mimic them completely but rather analyze how it fits to their organization. For example, the metadata criteria template should be customized by allowing each department and its employees to decide metadata criteria to make information easier to find. I will later in this chapter discuss how Seco Tools can design its metadata. (Dahlberg, 2014; Ekberg, 2014)

An important factor to consider in the ECM and KM strategies is the people management aspect. As explained by Quinn et al (1996), knowledge management is not a simple task and much of the information that exists in it originates from its employees. Blair (2004) and Brelade & Harman (2003) also share the same views as Quinn et al (1996) and explains that ECM and KM are not solely technology based but also heavily dependent on people within the organization. As explained by Wasko & Faraj (2005) and Lin (2011), large investments in IT technology and infrastructure does not always create successful KM and ECM implementations within an organization. To be successful, employees needs to commit and be willing to participate in the strategies that involves KM and ECM. A problem that Ekberg (2014) explains is that employees are sometimes reluctant to share information with each other and therefore be involved in the ECM process and knowledge sharing practices. In order for ECM to work properly, collaboration needs to a part of the Seco Tools culture. I believe that education has a key role when it comes to collaboration. Educating and engaging employees within Seco Tools that sharing is beneficial is important because it allows information to flow more freely and makes collaboration easier. The process of engaging and educating the employees in the ECM cycle is important also because it is a vital part of the ECM cycle when it comes to the capture of information. As explained by Blair (2004) and AIIM.org, the capture step is about identifying, classifying and collecting relevant business content into the systems that an organization use. Involving employees with the ECM is important because much of the information that is created and exists within organizations originates internally, i.e. from the employees, and not solely external sources as explained by Bhatt (2002) and Cheung, Lee & Wang (2005). Employees also need to be involved as they possess much of the professional intellect and knowledge within an organization. (Bhatt, 2002; Cheung, Lee & Wang, 2005; Ringel-Bickelmaier & Ringel, 2010;Quinn et al, 1996).

Strategies, policies, rules and guidelines are all critical steps when using the ECM cycle presented in the conceptual framework. As explained by Cameron (2011), Alalwan (2012), Vom Brocke et al. (2011a, 2011b) ECM is both a methodology, method and strategy used for the capture, management, storage, preservation and delivering of content and documents. These elements are therefore necessary steps
assisting to creating results for ECM implementations in organizations. They also provide organization to manage, capture, archive and deliver content to employees within an organization.

The strategies to govern information regarding the metadata criteria template is set by Sandvik, as that can be seen in figure 11. This template needs to be customized to the business needs of Seco Tools. It is here important that metadata criteria is set properly but not from a centralized and executive position. From a centralized organizational perspective in which the top managers of the organization are setting the metadata criteria is something that is difficult for a MNE such as Seco Tools. The reason for this is because the organization have many departments with thousands of employees spread around the world. All departments in all countries should use the same metadata in order to avoid confusion. If all e.g. marketing departments have their own sets of unique metadata criteria depending on their country then it can be confusing as each department might set different types of metadata. I believe that it is better to give employees the empowerment of setting their own metadata criteria for their global departments, taking advantage of the concept of folksonomies. (Stover & Bordner, 2011; Xu et al., 2008) Employees within a marketing department have better capabilities to set better metadata criteria and tags for what that is considered important to find information within SharePoint in their department than a manager that is not working in the same level of depth as the employees. The concept of having users in their corresponding departments setting the structure of which information is set is exactly what Stover & Bordner (2011) and Xu et al. (2008) explains regarding folksonomies. These types of taxonomies are user-driven, and I believe that this type of taxonomy can benefit Seco Tools because it takes a lot of the classification process of their hands and into the users themselves, which possess most knowledge about their work. Folksonomies are also the very type of taxonomy classification structure that Seco Tools needs because they do not have any type of strategy which means that they can save time and resources on using this type of classification, by letting its user do the “work”. Letting employees setting the criteria also allows them to be more involved in the overall ECM process and thus stronger collaboration and knowledge sharing practices are created.

In order for Seco Tools to start their governance and management of its large amounts of data in Microsoft SharePoint, it is important that they know what kind of information that they want to structure and which information that they deem as “value adding” to their organization. According to the interviewee Dahlberg (2014) it is difficult to find relevant information in IBM Lotus Notes as a result of the amount of noise that exists in all the databases and applications. To give an example in IBM Lotus Notes, users usually have a home screen that is filled with different types of icons that are called applications. These applications are databases, filled with information that Seco Tools fills it with. In many of these databases it is difficult for a user to find information because they usually contain large
amount of information that is irrelevant, i.e. noise. Irrelevant information in this context means information that is for example outdated or has no value for a user. The databases can be filled with e.g. “Meeting notes” that are a decade old. This type of information is only saved according to Dahlberg (2014) because it is thought that it “perhaps” can be useful for later. This means that information is never actually removed from the IBM Lotus Notes databases. Information is constantly accumulated and the amount of information is constantly increasing, making it more difficult for a user to find relevant information in piles of old and irrelevant information. My suggestion for Seco Tools regarding archiving in SharePoint is that they remove the information that they consider old and irrelevant and archive the information that they consider to be critical and value adding. This is important as Seco Tools does not want old and irrelevant information to accumulate in their new CMS, making it increasingly difficult for users to find relevant and updated information.

Ekberg (2014) explains that with SharePoint it is possible to set metadata regarding certain dates when documents should be archived. This archiving metadata criteria is something that I believe is a necessity for Seco Tools and something that they should take advantage of because it automates the process and saves time from investigating thousands of documents which might be impossible and very expensive. If each employee sets archiving metadata for their documents and data each time they create e.g. a document then it will ease the archiving process of the ECM cycle as much of it becomes automated.

The following section will address the analysis of enterprise content management in Seco Tools compared to the theoretical framework. The section will analyze how Seco Tools manages its information and what that can be improved in this area in order to structure the organizational data in a way which makes it easy to find information for employees within the organization but also to create results for the business.

5.3 Enterprise content management
5.3.1 Enterprise content management governance

To structure and govern information in a structured manner which makes it easy to find, it is necessary to have some kind of metadata and taxonomy information classification which provide employees with easy accessibility and findability of information.

As Kimiz (2011) explained in the theoretical framework, knowledge can be found in bountiful amounts in organizations today but the capabilities to use the information are limited. McInerney (2002) explains that knowledge isn’t always easy to understand and to find knowledge and information within an organization refers to processes that allows organization to understand and use information
objects. In the following two subchapters I will discuss what Seco Tools needs to do in order to understand and make their information relevant and useful but also easy to find by their users. The subsections will therefore discuss two important aspects of ECM implementations, namely metadata and taxonomies. The use of metadata is important in the ECM cycle as it provides the capture, archiving and delivery management tools for an organization.

5.3.2 Metadata
To find, manage and capture data with metadata is something that can be complicated, especially for larger organizations such as Seco Tools and Sandvik which possess thousands of applications and documents. As explained earlier, Seco Tools is lacking a proper IT strategy in which they can use to structure and govern its data both in its current groupware system IBM Lotus Notes and the planned CMS system Microsoft SharePoint. In this subchapter I will discuss the use of metadata and how it is an important and advantageous from an IT and strategic perspective. When analyzing the empirical findings, it can be seen that Seco Tools has not used metadata effectively with Lotus Notes. This means that Seco Tools now has the possibility to implement and use it when migrating their information to SharePoint in order to improve their ECM and KM strategies and implementations. (Dahlberg, 2014)

With the proper use of metadata or “tags”, Seco Tools can receive benefits of a strong structure and governance capabilities of information in its organization. Metadata is vital for Seco Tools because it allows the organization to manage and collect large amounts of data so that it can easily be found within Microsoft SharePoint. (Bjork, 2001; ISO 15489: 2001, Sheriff, et al., 2011) Metadata is also something that is necessary to find content in the jungle because it can answer to questions such as “What information is useful and where can I find it?” If these two questions are answered then it is possible to find the right information for the right user. (Sheriff et al., 2011)

Bentley (2001), Rockley et al. (2003), NISO (2004) and Day, (2006) explains the several benefits of using metadata software and platforms. Some of the benefits are better understanding the context of data, determining sources, re-use and better findability. A strong metadata criteria foundation can provide Seco Tools with the tools to succeed in its ECM implementation. It allows the organization to better understand the information that is created to be put into a context, better management of information through e.g. tags, better capture possibilities as a result of its tags, improved findability of archived information and improved findability of information for users searching information. Another benefit of using metadata is its platform and application independence which allows Seco Tools to use the same metadata criteria in other platforms than Microsoft SharePoint in the future. (Bjork, 2001; Haynes, 2004) Seco Tools should therefore actively use metadata when creating and storing information and knowledge in order to make it more accessible and relevant for its employees.
A problem of structuring information in Microsoft SharePoint is that all documents, digital assets and other types of information are not always easy to classify. Some types of information may contain different types of criteria and concepts which makes the information difficult to manage. This problem will occur when Seco Tools starts to migrate to Microsoft SharePoint and begin to structure the information into different databases and folders. Metadata can provide Seco Tools with the possibility of structuring information through different tags using folksonomies. I believe that with the assistance of folksonomies it becomes easier for Seco Tools to classify information since it is user-driven and helps the organization to structure its information in a more efficient way since it is the users with the knowledge that does the classification and governance.

Sandvik has set certain types of metadata criteria as a template that Seco Tools must use. This is something that I find beneficial for Seco Tools because it sets a strong metadata foundation which it can use. This template can be furtherly developed and customized by Seco Tools and it is something that I recommend them doing because it allows them to effectively use metadata that represents its organization and makes information easy to find. A possible method of setting metadata criteria is to have each department setting their own criteria of what they consider important. A marketing department could therefore set its own metadata criteria. This metadata can be different then the criteria which can exist in e.g. IT department. If the users are responsible for setting the metadata it will be easier for them to find information which they are looking for because they have themselves used the words they prefer for finding information, which increases the findability and capture of information. It is important that several users and employees are responsible for setting the metadata because if the metadata would rely on one person then it would be problematic if this person would e.g. quit or retire. Having several users responsible decreases the risk of this problem as it would unlikely if all employees within an department would quit or retire at the same time. (Cameron, 2011)
Figure 15: Relationship between departments and metadata. (Own illustration)

Figure 15 shows that each department in the Seco Tools organization can set their own metadata criteria. Marketing, IT, finance and other departments set their own metadata which means that it becomes decentralized, user-driven and empowers the employees working in corresponding departments.

Metadata is an important factor when increasing findability of content in CMS and Seco Tools should utilize the use of metadata as much as possible. To do this I believe that Seco Tools should try to maximize their utilization of metadata by implementing which metadata they deem as relevant for their business and different departments. Metadata is important because it provides a better understanding of content and its essence, but also making it more accessible by increasing its findability. (Mauthe & Thomas, 2004)

I believe that Seco Tools should before conducting their migration to SharePoint carefully plan which metadata that they consider important for their business. As a result of this action, Seco Tools will have metadata available in its information as it migrates documents and applications, making it easy to find by users. As explained by Ekberg (2014) and as can be seen in figure 11 in the empirical findings chapter, documents that are inserted into SharePoint are required to have some certain required metadata before being able to be inserted into SharePoint. This is an aspect that I believe is important. The reason to why Seco Tools should implement metadata requirements on all its documents and applications is so that all information that exists in SharePoint becomes easier to find and saves the organization resources. If Seco Tools decides to migrate all information without any metadata, then it
can be difficult to manually insert metadata for all documents and applications, because of the amount of information that exists. If metadata is applied before the migration then it becomes easier for Seco Tools to find their information in the future. For example by using the metadata criteria template all documents that are migrated are required to have certain metadata, which results in increased findability of relevant information.

I believe that the idea from Sandvik of forcing users to set certain metadata is favorable because it obliges users to follow the strategies and policies set by the organization. Seco Tools should use this strategy of Sandvik but in addition customize the template by adding metadata criteria depending on each department.

In the next subchapter I will discuss metadata further in relation to taxonomy classifications. After Seco Tools has migrated their information, taxonomies will be needed in order to govern and structure the information. In this subchapter I will also discuss managed metadata which is available in Microsoft SharePoint.

5.3.3 Taxonomies
As discussed in the theoretical framework, effective knowledge management requires a strong taxonomy structure. Single dimensional taxonomies are usually inadequate when it comes to the governance and classification of unstructured knowledge. (Cheung, Lee & Wang, 2005) Seco Tools has not implemented any type of taxonomy structure with Lotus Notes. In order to provide a stronger taxonomy structure and follow the theories of Cheung, Lee & Wang (2005), I recommend Seco Tools to use Managed Metadata application service available in SharePoint. This application can provide Seco Tools with a more advanced taxonomy structure. The Managed Metadata service allows the combination between traditional single dimension taxonomies and folksonomies which results in a stronger taxonomy for Seco Tools as it combines two different types of taxonomies. This service consists of a hierarchal collection of various central managed terms which makes it possible to define and use as attributes for various items such as documents. With the managed metadata service application Seco Tools can use managed metadata and share content in its business across several web applications and site collections. (technet.microsoft.com) In SharePoint it is possible to organize metadata centrally, organize and customize it depending on the business and make content easier to find in the jungle of information. I believe that Seco Tools should take advantage of this application available in SharePoint as it can assist them in structuring their information and making information faster to find and more relevant for its users. (Support.office.com)

The traditional single dimension taxonomy and folksonomies classifications both have their disadvantages and advantages. They complement each other in different ways. Folksonomies lack for
example some of benefits that exists in taxonomies such as being overall flat, unstructured and use the knowledge and input of its employees compared to traditional taxonomies which can possess controlled vocabularies applied by centralized by professionals. (Fichter, 2006; Stover & Bordner, 2011; Support.office.com)

I believe that the combination between the traditional taxonomy structure and the folksonomy is important and something that Seco Tools should implement in SharePoint because according to the theories of Cameron (2011), an effective taxonomy within an organization must mimic the terminology, vocabulary and understanding of the organization it is implemented within. The use of a folksonomy is therefore a satisfying choice to do these things because it is user-driven. This means that users will use their vocabulary, terminology and understanding when building the taxonomy which makes it more effective. (Cameron, 2011). Traditional taxonomies are advantageous as well as they can possess controlled vocabularies, tags and metadata which is important in order to follow the policies, guidelines and strategies set by Seco Tools parent company, Sandvik.

In the next section I will discuss some technical issues that exists when migrating from IBM Lotus Notes to SharePoint and how Seco Tools can avoid and reduce the chances of making mistakes.

5.4 Migrating to Microsoft SharePoint

There exists a high degree of possibility of failure with the implementation and migration to Microsoft SharePoint and other type of CMS as explained by Chua (2009), Storey & Barnett (2000), Lucier & Torsilieri (1997) and Bramscher & Butler (2005). In order to create results with its ECM it would be advantageous to migrate to SharePoint in a way that is compatible with Lotus Notes, so that applications and data is not lost. As explained in the theoretical framework by Walch (2011), Wilson & Van der Beken (2003) and Bisbal et al., (1998), the possible methods of migrating from Lotus Notes to SharePoint are numerous. The methods that are the most suitable are difficult to pinpoint as most methods serve different purposes. I believe that a migration to standard lists in Microsoft SharePoint is one of the most suitable methods for Seco Tools. The reason for using standard lists is that the applications and data that is found in Lotus Notes have some kind of equivalent method of storage in SharePoint if used with standard lists. The discussion databases, document libraries, calendars et c., can all be migrating using standard lists because of their compatibility. Although standard lists is one of the migration methods that I prefer for Seco Tools, I believe that Seco Tools can use other types of migration methods simultaneously. Document libraries are for example very similar to standard lists which means that they also are a possible choice of method for the migration. Wiki pages are one of the most popular pages types in Microsoft SharePoint due to its simplicity and central design, is also a possible method of migration. There are also possible general methods which are discussed by Wilson...
& Van der Beken (2003) and Bisbal et al., (1998) such as COTS, encapsulating (wrapping), new development and conversion, but I believe that using standard lists is a better choice as this migration method is specifically targeting Microsoft SharePoint.

A possible disadvantage of migrating all information which exists in Lotus Notes to SharePoint is that it takes space and this can become a cost. I however believe that the migration of all information is worth the cost because the information that is migrated can be worth more. There is a possibility that information is duplicated when migrating all information and in order to fix this problem the departments of Seco Tools needs to decide which information that is the most recent and valid. It should be the employees and content owners that decide this as they possess the knowledge and. When this is finished, old information that is not valid can be removed.

Storage and archiving are something that is relatively affordable, and therefore any cost issue regarding storage is negligible. Microsoft SharePoint also has a cost effectivity advantage towards Lotus Notes, which makes a cost disadvantage less likely. (Dell, 2014)

A problem that one of the interviewees, Dahlberg (2014), explained with the migration to SharePoint is that certain documents and information is difficult to classify under a traditional taxonomy. For example a document for the IT budget is difficult to classify. Should this document be classified and stored in the folders of the IT or Finance department? The answer is that it should not solely be either one.

![Diagram](technet.microsoft.com, 1D)

**Figure 16:** Illustration of how content is stored in an authoring site collection, how it is indexed by the search system and reused across separate publishing collections. (technet.microsoft.com, 1D)
Figure 16 shows a system solution to this problem existing in SharePoint. By storing information as this example, the IT budget document will be stored in an authoring site collection (Site collections consist of one-top level sites and all sites below it) making it available in SharePoint. This makes it possible for several publishing site collections to through the search engine to find the same information. (technet.microsoft.com, 1C; technet.microsoft.com, 1D)

As Malmström (2014) explained in the interviews, the primary reason for the migration to Microsoft was because of strategic reasons. Seco Tools and Sandvik have positive remarks of SharePoint as it has a leading position in its area of use. The migration to SharePoint is seen as a necessary step in the Sandvik and Seco Tools overall strategy. This is because Lotus Notes is fading in its popularity and uses. As a result of Microsoft SharePoint having a leading position it is easier for Seco Tools and Sandvik to find developers, meanwhile for Lotus Notes it is becoming increasingly difficult. I believe that Seco Tools and Sandvik have chosen to migrate to Microsoft SharePoint with good reasons. When the migration to Microsoft SharePoint is completed, Seco Tools and Sandvik can continuously manage and govern its information effectively using developers and other SharePoint related advantages such as improves search capabilities and integration. If the migration to SharePoint would not have taken place then it would be increasingly difficult and expensive to use Lotus Notes as most developers are moving away from this groupware that is becoming outdated. (Wilson & Van der Beken, 2003) Information would be increasingly difficult to manage as fewer developers exist. Microsoft SharePoint can therefore be considered to be a satisfying choice to store information and build applications. It is important that Seco Tools and Sandvik understands the advantages that exists in Microsoft SharePoint because most CMS implementations fail because of poor understanding of the technology and poor planning. Understanding the advantages that exists in the technology can therefore assist Seco Tools and Sandvik to plan how to structure and use Microsoft SharePoint. Advantages are not always new functions and technologies but can also be of strategic significance as explained earlier, by e.g. the availability of developers and cost efficiency. (Bramscher & Butler, 2005; Stover & Bordner, 2011).
6 Conclusions

This chapter will present the conclusions of the investigation of this study. The concluding results derive from the analysis and research questions of this study.

A successful migration and ECM implementation with Microsoft SharePoint in which users easily can find information requires several different elements that work together. To easily find information in the jungle of information an organization needs governance, metadata, strong taxonomies and organizational culture which encourages collaboration and the sharing of information between the employees.

To successfully migrate to Microsoft SharePoint and structure the organizational information, Seco Tools need to:

- Understand methods of migrating information to Microsoft SharePoint.
- Set a strong governance and management structure of how information is handled.
- Use knowledge governance and management tools available in SharePoint, such as metadata, Managed Metadata and taxonomies.

Seco Tools have different types of information that needs to be migrated in the form of applications and data. The recommended migration destination in SharePoint in this study is to use standard lists. Seco Tools should use standard lists to store most of their information because it is compatible and closest equivalent form of storage found in Lotus Notes. This would make the migration process easier as it avoids technical issues that can found in migrations. Besides using standard lists, Seco Tools can also use document libraries and wiki pages which is one of the most popular pages types in SharePoint due to its central design and simplicity. It is difficult to migrate all types of applications to SharePoint. Customized applications are for example difficult to migrate as they might not work in SharePoint due to compatibility problems and must be created once again in the new environment. These types of applications need to be redeveloped into the Microsoft SharePoint platform.

In this thesis I have used an ECM cycle as the conceptual framework which provides guidance to ECM implementations in organizations such as Seco Tools. The ECM cycle is already in use by Sandvik. Seco Tools should use this cycle to create results and acquire the benefits for its users such as increased findability and collaboration.
With the ECM cycle I have tried to analyze how Seco Tools can implement ECM in its organization. For each step of the six step cycle I analyzed how Seco Tools can improve their overall content management in their organization.

The first step of the ECM cycle is the creation of information. In order to implement ECM, migrate and use SharePoint successfully, an understanding of information is needed by Seco Tools. A strong understanding of data, information, knowledge and content is needed because it allows Seco Tools to separate information that is considered critical from noise. When Seco Tools does this it has the capability to put data into context and make it more useful and valuable within the organization. The creation of information in the ECM cycle originates from the employees within the organization but also from external sources, outside the organization. As there are large amounts of information it is important to be able to separate what that can be considered as noise and what that is valuable as it has a purpose and context. This process is important as it helps to find the right information to the right person. Seco Tools should follow the same information classification as Sandvik in order for it and its parent company to work together more effectively. This can be important because if an employee from Sandvik wishes to find information in Seco Tools then the same “train of thought” of what that is considered important can help the employee to find information better. Seco Tools should also have content owners for each department which decide which information that is considered important during and after the migration. These content owners can see which information that is considered as noise and which that is content and value adding for the organization.

The second step of the ECM cycle is the management of information. In this step Seco Tools can use strategies and methods to govern and manage their data. The current and best solution for Seco Tools which lacks strategies and policies regarding their migration and knowledge management, is to use the resources available to them from Sandvik. Seco Tools should use e.g. the metadata template created by Sandvik, and customize it to their business. A recommendation deriving from the analysis of this study is to make the metadata user-driven, which makes it powered by its employees to save time and resources. As folksonomies, Seco Tools can allow its departments and employees to build metadata criteria and tag structure which allows relevant information to become more accessible to users. The strategies that are chosen by Seco Tools to manage their information are important to capture information from SharePoint. With a strong information classification, users can more easily find relevant information. I also recommend Seco Tools to take advantage of the functions available in SharePoint such as the managed metadata service which allows it to combine both traditional taxonomies and folksonomies.
The third step of the ECM cycle is the capture of information. The capture step is heavily influenced by the previous step, i.e. manage. In order to capture information from a user perspective one must first have some kind of metadata and taxonomy classification which is used for both the management and capture of critical and valuable information. Users of SharePoint need to be able to find relevant information easily. In order to do this I recommend as previously discussed, to use a combination of traditional taxonomies and folksonomies to build a strong information classification structure in SharePoint. Users can themselves search for keywords that are predefined and increase the findability of information by creating their own tags to attach to information objects such as documents and other types of files.

An important and underlying factor of the capture step is the people management aspect. Much of the content that is captured in the ECM cycle is created by the employees. Employees within Seco Tools need to collaborate with each other and create a culture in which information can easily be shared. I recommend educating the employees regarding knowledge sharing to increase their collaboration awareness. Too many security permissions can restrict the process of employees sharing information with each other. It is better to keep an environment which is open and not restricted for most information areas, except those which contain sensitive business information.

The fourth step is archiving. This process can be achieved through from a system perspective using metadata automation in SharePoint. Sandvik is planning to use this type of automation to archive old content in SharePoint. Seco Tools can easily take advantage of this as they also have the possibility to use this function. This is an important step as it allows users to find old information that can be important to possess, for e.g. compliance questions et c.

The fifth and sixth steps are the delivery of information to the end users and results. In order to deliver relevant information to the users of SharePoint, one must have understood which information that is relevant, managed it, captured the valuable content and archived it so that users can access and find the information whenever they wish.
7 Future research

The future research is the final chapter of the thesis and has the purpose of presenting suggested future research areas which I have perceived as interesting and relevant for the study.

The migration process to Microsoft SharePoint is a large process and it is difficult in a bachelor thesis to research every aspect and method of how knowledge can be managed and migrated to a CMS. This thesis has focused on researching areas which can benefit Seco Tools regarding findability and structure of information. The area of knowledge management, enterprise content management and application frameworks such as Microsoft SharePoint are large and there are possibilities to conduct several more studies to cover all interesting aspects.

An interesting future research area are multi-facet taxonomies and the research of their implementation in SharePoint. Other interesting future research areas are migration methods.

Multi-facet taxonomy systems (MTS) are multi-faceted are multi-dimensional taxonomies which provides organization to classify assets of knowledge under several concepts at any level of abstraction. Multi-faceted taxonomies have the capabilities to interpret relationships between different concepts. (Cheung, Lee & Wang, 2005)

It would be interesting to see how an implementation of MTS taxonomy structure can be done in a large organization such as Seco Tools. MTS have some unique advantages compared to traditional taxonomies support for artificial intelligence (AI) technologies which can provide self-maintenance, personalization, intelligent searching and automatic classification. (Ibid) In this study however, I have limited myself in studying how Seco Tools can find information using traditional taxonomies, folksonomies, metadata and the managed metadata service available for SharePoint. (Cheung, Lee and Wang, 2005)
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Appendices

This chapter presents the interviews and its questions with the employees in Seco Tools and Sandvik.

Appendix 1
Interview questions with Anders Dahlberg, IT Demand Manager

Questions:

1. How does Seco Tools work with rules and guidelines for information sharing and the structure of information within the organization?

2. Does Seco Tools have any type of classification or taxonomy in place in Lotus Notes? And have Seco Tools started to create some type of classification or taxonomy for Microsoft SharePoint?

3. How does the framework of documents, information and content look like for Seco Tools and Sandvik today?

4. How does Seco Tools use metadata in their knowledge governance today? And how are you planning to use metadata in the future with Microsoft SharePoint?

5. When will Microsoft SharePoint be launched?

6. What is the current strategy when migrating to SharePoint?

7. What is the view on access, permissions and security of information? How should this be structured?

8. Why has there been a change from IBM Lotus Notes to Microsoft SharePoint?

9. Which benefits and disadvantages exists with IBM Lotus Notes and SharePoint?

10. What is the current plan of a user finding relevant data in SharePoint?
Appendix 2
Interview questions with Thomas Persson, Information Controller

Questions:

1. How does the framework of documents, information and content look like for Seco Tools and Sandvik today?

2. What is the current strategy when migrating to SharePoint?

3. What is the view on access, permissions and security of information? How should this be structured?

4. Why has there been a change from IBM Lotus Notes to Microsoft SharePoint?

5. Which benefits and disadvantages exists with IBM Lotus Notes and SharePoint?

6. How is metadata currently used in IBM Lotus Notes? And what is the future structural plan for Microsoft SharePoint?

7. What is the current plan of a user finding relevant data in SharePoint?
Appendix 3
Interview questions with Ann-Cathrine Ekberg, Enterprise Content Manager

Questions:

1. How does the framework of documents, information and content look like for Seco Tools and Sandvik today?

2. What is the current strategy when migrating to SharePoint?

3. What is the view on access, permissions and security of information? How should this be structured?

4. Why has there been a change from IBM Lotus Notes to Microsoft SharePoint?

5. Which benefits and disadvantages exists with SharePoint?

6. What is the future structural plan for Microsoft SharePoint?

7. What is the current plan of a user finding relevant data in SharePoint?

8. How is information backed up? And what is the current strategy today?

9. What is the strategy of maintenance regarding information in SharePoint? Who controls e.g. which files that becomes archived?

10. How are you working within the organization to make employees willing to share information with each other? Do you educate employees to share critical and important information with each other in a structured manner?

11. Do you have any kind of taxonomy classification structure strategy? How will information be “inserted” in SharePoint?

12. When will SharePoint be launched?
Appendix 4

Interview questions with Magnus Malmström, IT Manager

Questions:

1. How does the framework of documents, information and content look like for Seco Tools and Sandvik today?

2. What is the current strategy when migrating to SharePoint?

3. What is the view on access, permissions and security of information? How should this be structured?

4. Why has there been a change from IBM Lotus Notes to Microsoft SharePoint?

5. Which benefits and disadvantages exists with IBM Lotus Notes and SharePoint?

6. How is metadata currently used in IBM Lotus Notes? And what is the future structural plan for Microsoft SharePoint?

7. What is the current plan of a user finding relevant data in SharePoint?