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Microsoft SharePoint and IBM Connections Content Management Issues

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Bachelor's thesis
December 2016
Natural Sciences
Business Information Systems

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Abstract

This research paper focuses on one of the two biggest players on of Enterprise Content Management (ECM) market, i.e. Microsoft SharePoint and IBM Connections Suite.
The topic was suggested by the management of Descom Oy as the company sells IBM E-Commerce solutions. In recent years they have shown interest towards approach the content management market. In order to prepare themselves to sell IBM Connections, sellers need to understand what Microsoft SharePoint is compared with IBM Connections.

The research used qualitative and quantitative methodologies. The quantitative research uses well known internationally recognized and reliable research bodies, whereas the qualitative research was based on online articles and books on the subject.

The research was developed by first present ECM theory and a literature review focused on the requirements needed for projects to succeed. It was also studied what makes the project fail. The last part was ECM systems features presentation and a comparison between the two systems focused only on showing the differences and applications of both systems.

The conclusion presents a list of points useful to vendors to help their customers to carry out a self-assessment before implementing an ECM system. This self-assessment will ensure that the clients are well prepared and committed to the system success while protecting vendors from customers' negligence.

Miscellaneous

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Kuvailulehti

Tekijä(t) Baldissara-Kunnela, Renata	Julkaisun laji Opinnäytetyö, AMK	Päivämäärä Joulukuu 2016
	Sivumäärä 115	Julkaisun kieli Englanti
		Verkkojulkaisulupa myönnetty: x

Työn nimi
Microsoft SharePoint ja IBM Connections sisällönhallinta markkinoiden Ongelmat

Tutkinto-ohjelma
Tietojenkäsittelyn tutkinto-ohjelma

Työn ohjaaja(t)
Bister Timo

Toimeksiantaja(t)
Descom Oy/Solteq Oy

Tiivistelmä

Tämä tutkimus keskittyi Enterprise Content Management-markkinoiden (ECM) kahteen suurimpaan toimittajaan, jotka ovat Microsoft SharePoint ja IBM Connections suite. Opinnäytetyön aihetta ehdotti Descom Oy:n johto. Kyseinen yritys myy IBM E-Commerce – ratkaisuja. Viime vuosien aikana heitä on alkanut kiinnostaa ECM-markkinoihin osallistuminen, mutta se vaatii valmistautumista. Heidän täytyy ymmärtää, miten Microsoft SharePoint eroaa IBM Connectionista voidakseen myydä sen tuotetta.

Tutkimuksessa käytettiin laadullisia ja määrällisiä menetelmiä. Kvantitatiivinen tutkimus perustui kansainvälisesti tunnettuihin ja luotettaviin tutkimuslaitosten tutkimuksiin. Laadullinen tutkimus perustui online-artikkeleiden ja kirjojen tietoihin aiheesta.

Tutkimus tehtiin käymällä ensin läpi teoria ECM:stä. Kirjallisuuskatsaus keskittyi siihen, millaisia vaatimuksia ECM-hankkeilla on onnistuakseen. Myös epäonnistumisen syitä selvitettiin. Viimeisessä osassa käytiin läpi ECM-järjestelmien ominaisuuksia ja sitä, miten vertailtavat kaksi järjestelmää eroavat toisistaan. Vertailussa keskityttiin kuvaamaan järjestelmien eroavaisuuksia ja käyttömahdollisuuksia.

Tutkimuksen tuloksena on luettelo, jonka myyjä antaa asiakkaille itsearviointia varten ennen ECM-projektin alkamista. Listan avulla varmistetaan, että asiakkaat ovat hyvin valmistautuneita ja sitoutuneita ECM-käyttöönoton onnistumiseen.

Avainsanat (asiasanat)
Microsoft SharePoint, IBM Connections, ECM, Enterprise Content Management, ECM strategy

Muut tiedot

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1   Introduction

This paper aims to point out the differences between Microsoft SharePoint and IBM Connections to allow these platform dealers to have a better sense of what each of those software solutions can do, what they lack, how they can complement each other and what their buyers need to be aware before choosing one platform over the other. In the process of describing both platforms in detail, this paper touches superficially some important considerations such as "searchability," "mobility" and the cloud. Searchability and mobility are terms used within software development. The former means the ability to search documents efficiently, while the latter means the capacity to access content within the platform on any device. (Larrivee, 2013)

Enterprise Content Management (ECM) encompasses technologies, tools and methods to capture, store, manage and share content across the organization (Larrivee, 2013). As information increases by the minute, within and outside the company, information became an asset that should be used as a competitive advantage and is where ECM solution platforms became essential. In a nutshell, ECM solutions allow organizations to tailor their information and content needs for their benefit. The competitive advantage to organizations is in itsit's ability to find, use, re-use, edit, access content in the different form factors, and share their information internally and externally. It's the usage of the information that empower people. For all these reasons ECM purchasing decision-making raises uncertainty due to the huge number of features, these platforms offer, and how their customization can meet effectively customer's needs. The clients of ECM solutions encounter problems when they seldom purchase it based on a carefully planned ECM strategy. The lack of customers' understanding leads to poor adoption and lack of clear maintenance strategy, which leads to implementation failure. (Larrivee, 2013).

This research paper focuses on the two biggest players in the market of Enterprise Content Management (ECM): Microsoft SharePoint and IBM Connections Suite. The author is knowledgeable in Microsoft SharePoint 2010 and 2013, including cloud-based SharePoint 2016 and Yammer. The knowledge of IBM Connections was acquired when working for Descom Oy and using IBM Greenhouse Lotus cloud where

this paper has been partly published and discussed with IBM Connection experts to gain better insights about the product and for what it is better suited.

Descom Oy, now Solteq Oy, is an IBM partner that among other places in Finland has an office in Jyväskylä. Descom management suggested this research paper topic. Descom research request was based on their lack of knowledge about Microsoft SharePoint, which is an alternative for IBM Connections system they represent.

The relevance of the topic for sales and consulting people is unquestionable due to the possibility to understand the strengths and weaknesses of both ECM platforms. Descom main benefits are a) To understand their own ECM platform; b) To acquire knowledge of the foreign ECM platform, which they are not familiar; c) To help sales and pre-sales consulting professionals to be more aware of what they can offer to customer and how to reply when facing customers' questions about foreign ECM platforms, and finally d) To have an idea of what to consider regarding the lack of clients' understanding when purchasing, deploying and maintaining their ECM solution.

2   The Research Methodology

Qualitative and quantitative research methods have been chosen to conduct this study. The quantitative research used is from internationally well-known and reliable researcher bodies such as Gartner Inc., Forrester Research Inc., and AIIM that is the Association for Information and Image Management. All these quantitative researchs were published between 2013 through 2016 and are intended to help understand the strength and weaknesses of IBM and Microsoft ECM solutions in a holistic manner.

The qualitative research comes from exploring articles and video instructions published on Youtube by the vendors in question.

The main objective of this research paper is to point out the differences between

Microsoft SharePoint and IBM Connections while helping IT sales and consulting people to be more sensitive to customers' lack of knowledge before, during and after these ECM platforms are deployed.

The conclusions and recommendations should help vendors to understand their competitors better while helping their customers to consider the severe effects of the post-development project. These are the main reasons for ECM project failures. Once customers have a better understanding that success is deeply related to pre- and post-project considerations, customer satisfaction should raise significantly.

This research paper tries to answer the following questions:
1. What is ECM system and why organizations cannot afford to be without one?
2. What can Microsoft SharePoint offer?
3. What can IBM Connections offer?
4. How both ECM platforms complement each other?
5. What are the main differences between Microsoft SharePoint and IBM Connections?
6. What are the points to consider when planning a successful ECM project?

3   Review of the ECM Theory

This section the author reviews the theory regarding Enterprise Content Management meaning and why modern organizations cannot afford to be without one that fulfills their information management requirements.

3.1   The Meaning of Enterprise Content Management

The most simple definition of Enterprise Content Management (ECM) is a software system capable of creating, capturing, storing, organizing and managing the information throughout its lifecycle. (Admero, n.d.)

Riley & White on their e-book states:

> *"ECM is a set of practices, processes, and methodology that make the technology morph into the most effective way to store, secure, and consume content." (Riley & White, 2013)*

ECM software systems excel in their ability to manage any documents, web content, records, digital assets, workflows and have essential document management capabilities such as powerful search that allow all the content to be easily located and accessed whenever needed. The ECM system major advantage is the ability to provide business people and decision-makers with the control they need over their structured and unstructured information while making it available anywhere and anytime. (Larrivee, 2013)

3.2   ECM systems main benefits

The main benefits of ECM systems are to improve efficiency, offer better control of the organization's information and resources while reducing costs. Gartner's evaluation of ECM system weights the different ECM parts and gives them a grade according to its importance in percentage. See the Gartner research table (Table 1) below.

ECM gade parts by Importance

ECM grade parts by Importance	
1. Document management	20% of what users do on ECM systems.
2. Content Workflow	20% of what users do on ECM systems.
3. Image-processing applications	15% of what users do on ECM systems.
4. Social Content	15% of what users do on ECM systems.
5 Extended Components	15% of what users do on ECM systems.
6. Records management	10% of what users do on ECM systems.
7. Web Content Management	5% of what users do on ECM systems.

Table 1: Source Gartner Magic Quadrant for Enterprise Content Management (Karen A. Hobert, 2016)

The most used features in Gartner research are related to content management. They are in order of importance document management, content workflow, image

processing, social content and extended components. These essential five features can summarize the core of any good ECM system. The social content has the same grade as image-processing and extended components because document management is meant to be shared, reviewed, commented and tagged according to importance to help others within the organization find and benefit from it. (Koehler-Kruener;Chrin;& Hobert, 2015)

The details of what an ECM system is and its full complexity are described in depth in this paper in the section 4.1 AIIM Enterprise Content Management in the Information Age, under the chapter four of Literature Review. (Larrivee, 2013)

ECM systems can be delivered in three different ways: on-premises, SaaS and Hybrid form (Larrivee, 2013):

a) **On-Premises** is a term which refers to information systems installed within the organization's hardware resources and network. Large enterprises still prefer On-Premises systems to keep their systems in-house making them more secure than in the cloud.

b) **SaaS (Software as a Service)** is a term used when the information is stored on the software manufacturer's system (referred as the cloud). It is a solution that is web accessible whenever the user needs. SaaS can also be referred as Cloud Content Management (CCM), Cloud Enterprise Content Management (CECM), Web Content Management (WCM) and Cloud Data Management Interface (CDMi). Cloud solutions are very commonly used nowadays. However, SaaS systems have downsizes as they are not yet able to deliver the full range of solutions that is possible to deliver with On-Premises systems. In addition to that, cloud solutions impose the risks of being managed by companies anywhere on the planet, which poses security risks. WCM solutions are becoming very popular, and they are delivered to micro, small and even medium enterprises with success as long as they fulfill the organizations' content lifecycle management.

c) **Hybrid solution** is a term used to describe the mix of both On-Premises and SaaS applications. It is becoming the industry standard. Organizations nowadays use file synchronization and mobile to access content in different

form factors according to their needs. ECM systems are already being served as hybrid systems to organizations choosing this method of delivery.

Microsoft SharePoint and IBM Connections offer their ECM platforms on all these three delivery systems. However, both Microsoft and IBM have many complementary sets of applications for their ECM solutions in SaaS beyond the scope of this paper.

3.3   Can modern organizations afford not have an ECM system?

Organizations are composed of business vision, strategy, culture and internal and external information resulted from customers and partners' interaction. ECM systems bridge the gap from the multi-channels within business information management that should be easy to learn and user-friendly. (Larrivee, 2013)

Modern organizations face nowadays the challenge to constantly create and share all types of content to internal and external social media, such as video, podcast, interactive, dynamic forms, presentations, reports and PDFs. This increasing need for knowledge sharing, mobility, and social media usage within organizations is what makes ECM systems indispensable. (Larrivee, 2013)

The driver for ECM business is the ability to generate, edit, manage, share and dispose of content anytime, with easy and throughout all form factors. The difficult question is to know how decision-makers can evaluate ECM vendors as they have to consider the additional social, mobility, responsiveness, cloud storage and synchronization capabilities required in this information era. All these features give back the information control to the users because their success of their daily tasks depends on what tools they use. (Larrivee, 2013)

Can modern organizations not have an ECM system? Forrester research answers their questions by saying that today's organizations only have a better chance to survive if they change their business focus from product or service based on customer oriented, which ultimately means organizations cannot afford to be

without an Enterprise or Web Content Management of some sort. (Koplowitz, The Forrester Wave: Enterprise Social Platforms, Q2 2014, 2014)

3.4   Summary

Enterprise Content Management is a complex software system capable of creating, capturing, storing, organizing and managing information. It can manage any information content and enable users to search, edit, access and share it anywhere, anytime and in any form factor. (Larrivee, 2013)

ECM gives business people the control over the information they need on a daily basis to perform their job effectively. It improves organization's efficiency while reducing costs. ECM is delivered On-Premises, Software as Services (SaaS) and Hybrid solutions. Modern organizations, in an information era, only succeeds and are empowered to grow if they have an Enterprise Content Management or Web Content Management of some sort. (Larrivee, 2013) This section detailed what ECM system is and answered why organizations cannot afford to be without one.

4   Literature Review

Information is useless if it cannot be consumed by the people who need. This chapter is dedicated to theory review based on the expertise of AIIM, Microsoft and IBM among others (Larrivee, 2013). The objective of this chapters goes through in depth of ECM theory and its infrastructure. Then, detail the features of Microsoft SharePoint and IBM Connections as well as if these platforms can complement each other.

4.1   AIIM Enterprise Content Management in the Information Age (Larrivee, 2013)

According to The Global Community of Information Professionals (AIIM), information power comes from the use and the meaning people give to it, which in many cases turns information into some currency. (Larrivee, 2013)

ECM system includes technologies, tools, and methods to capture, store, manage and share content across organizations (Larrivee, 2013). Some of the most significant benefits of a properly implemented ECM system are the improved access to content and the ability to reuse content. Larrivee states

> *"…technology is only part of the solution. You must select the right technology for your particular business issues. The best technology installed in the wrong way (or for the wrong problem) is often useless."* (Larrivee, 2013, s. 1)

Information is a competitive advantage for most industries. Terms such as big data is commonly used nowadays everywhere in this information era. Information management requires that some questions be answered in advance. Questions such as How to provide the right data to the right person at the right time in a secure manner without any geographic barriers independent of the form factors, and in such a way people want to consume it? The answer to this question empowers decision-makers to make the right decision. (Larrivee, 2013, s. 2)

ECM is referred as a software system that manages the whole spectrum of the content lifecycle (Larrivee, 2013). AIIM stands for the Association for Information and Image Management, and it is the global community of information professionals. This section is based on Bob Larrivee's article in AIIM title of "ECM in the information Age." (Larrivee, 2013)
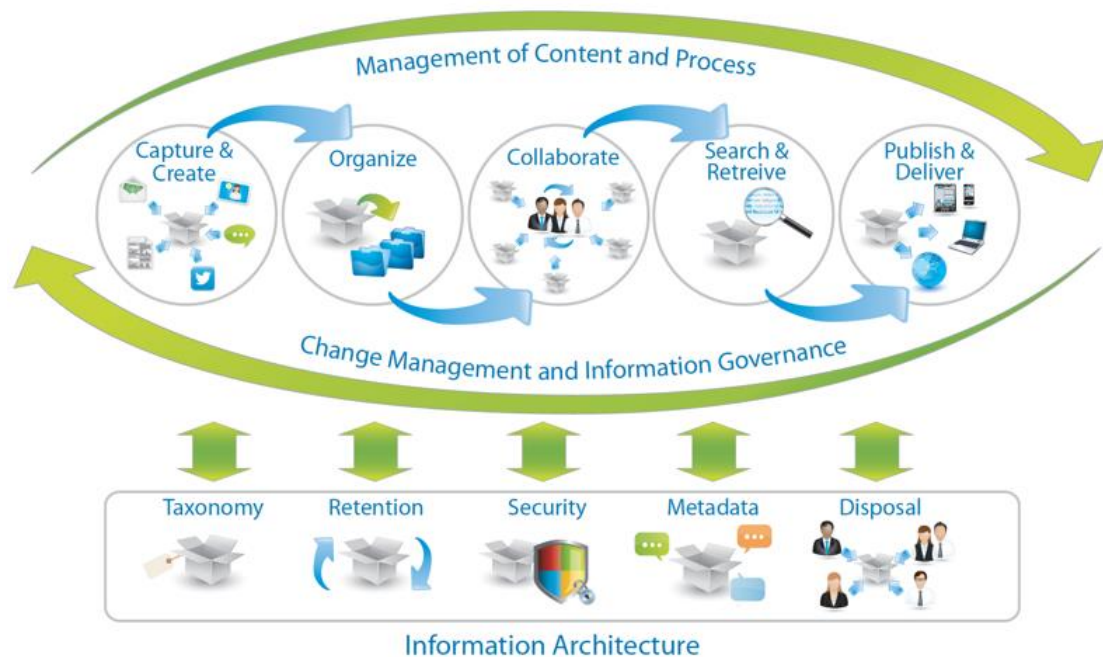
Figure 1: The content lifecycle. (Larrivee, 2013, s. 1)

The infrastructure modules above are the structures which an ECM system is consists. The five core elements of content management and process are capture & create, organize, collaborate, search & retrieve, and publish & deliver. The five information architecture modules are Taxonomy, Retention, Security, Metadata, and Disposal. Together, the core and infrastructure modules from the full complexity of what is an Enterprise Content Management lifecycle.

4.2   ECM Infrastructure Complexity

Ph.D. Reginald J. Twigg at IBM has a presentation about the challenges of building ECM taxonomies and the role of classification technologies regarding maintenance of ECM effectiveness. The seven building blocks of IA (Information Architecture) are described below with definition: (Twigg, Ph.D., 2007)

a) Taxonomy is a term to describe the way humans organized and classified content hierarchically. It is a way people make sense of information and relate to for easy access. The best way to understand what taxonomy is to use an analogy, e.g. In a house a kitchen has all the tools a person could need in different compartments and stored in an easy way to find each item. Taxonomy does the same thing. It compartmentalizes the ECM system.

b) Metadata is a term that defines the data about the data. It simply describes the content in an easy to consume way, e.g. Where is the data located, who created it, when was it created, what type of data it is. All this information is stored with the content.

c) Classification of content has the same purpose as taxonomy, to help information to be accessible. Classification differs from taxonomy because in addition to helping information to be accessible; it also exposes the data within groups of recognizable meanings to the customers' specific industry, e.g. The medical information about a patient is unique to the medical industry which is entirely different from the information regarding an employee's personal and work life. The medical categorization of data has no meaning to the human resources of an organization.

d) Enterprise Catalog is a metadata model used for unstructured content to allow consistent services across ECM applications. Unstructured content is a term employed by the people who work in a specific industry, which gives content meaning to that specific user or a group of users. An Enterprise Catalog can be general or industry specific, and it allows organizations' members to add terms by themselves to the system, which in turn helps them to make sense to what the data means.

e) Retention is the period which business documentations, also called records, should be retained in the archive to comply with the audit law in vigor. Once the retention period is over the Disposal module enters in action, which determines how these records should be disposed or destroyed. (National Archives, n/a). Retention and Disposal belong to Record Management, which is the process where the document's creation, maintenance, use, and disposal are managed in compliance with the organizations' policy. It is a process required to be in compliance with audit and law. (National Archives,

n/a)

f) eDiscovery is a term particularly used for legal electronic records or content. It determines the way electronic records should be archived and disposed legally. It is most used in official government entities. eDiscovery belongs to Record Management. (Riley & White, 2013)

g) Security is an essential part of ECM. IBM Connections Suite 5 manual guide resumes the importance of security very detailed in the following quote:

> *"IT system security involves protecting systems and information through prevention, detection, and response to improper access from within and outside your enterprise. Improper access can result in information being altered destroyed or misappropriated or can result in misuse of your systems to attack others. Without a comprehensive approach to security, no IT system or product should be considered complete and no single product or security measure can be completely effective in preventing improper access." (IBM, 2016, s. 8)*

The ECM content lifecycle in Figure 1 depicts the entire content lifecycle from the information generation to its disposal. It encompasses many elements that are far more complex than it may seem at first glance.

The amount of information generated in organizations nowadays should be tailored to meet individuals' specific needs regarding the content process, change and governance required by the organization.

The seven key points that drive businesses to purchase ECM are:
1. Increased operational efficiency
2. Cost reduction
3. Enhanced litigation support
4. De-duplication of content
5. Risk reduction
6. Value-added services
7. New ways of working

AIIM advises organizations to consider each of the seven key points listed above in the following process: (Larrivee, 2013)

a) To identify where and how the seven key points align to the organization's needs and goals.
b) To turn the seven key points into questions to be answered.

    I)   *"Is your organization faced with the challenges of litigation such as ediscovery?"*

    II)   *"What amount of effort is used to identify, sort, and present all of the electronic information requested?"*

    III)   *"How much duplication of your information assets is there and would de-duplication be beneficial?"*

Larrivee (Larrivee, 2013, s. 2) emphasizes that without a holistic view and understanding of the organization's information environment, including the people and process involved, any attempt to implement ECM might fail.
In order to avoid failing, Larrivee (Larrivee, 2013, s. 2) points out what is a must to understand before choosing and implementing any ECM system. Examples can be named as What is the information worth to the organization taking into account both internal and external value?, What is the entire information lifecycle?, Who, when, what and where the information is needed?, How can it be found?, How is information captured?, How would information be or should be searched?, and How is information intended to be accessed?

A strong point Larrivee (Larrivee, 2013, s. 2)makes about the usefulness of the information is, that some organizations manage information without a compelling reason. If the information collected or stored is not needed to the core business functionality and well-being of the organization, it should not be managed.

Larrivee (Larrivee, 2013, s. 2) points out that although ECM system is proved to improve information management practices, information can also cause problems. A clear strategy and understanding of the use and applications of an ECM system are needed to achieve its desired outcome best.

4.3   ECM Projects Requires Strategy Development

In order to develop a strategy to choose and implement an ECM system, Larrivee (Larrivee, 2013, s. 2) suggests the business project must be aligned with the specific business needs of the organization. The best way to develop a strategy is to use the AIIM seven key points described in the previous section. The seven points are increased operational efficiency, cost reduction, enhanced litigation support, de-duplication of content, risk mitigation, value-added services and new ways of working. Then to align them to the "4 Cs" that are Compliance, Collaboration, Cost, and Continuity, described below.

COMPLIANCE with regulations: Larrivee (Larrivee, 2013, s. 2) states that compliance:

> "…should be viewed as an opportunity to improve common business process."

If compliance is not taken into consideration cost can be extremely high when new regulations are put into place, or old ones are changed. The organization should be prepared to react accordingly. The need to comply is determined by the core operational requirements. Proactive ECM strategies are the key to ensuring that records management, business process management, legal, and IT follow best business practices within the content lifecycle.

COLLABORATION – the knowledge exchange and communication.
The organization's knowledge sharing and communication are fundamental to successful business operation. Technologies such as instant messaging, whiteboards, online meetings, email, social tools, blogs, group sites are just a few of the ECM systems' social collaborative tools that make the different areas of an organization work together anytime and anywhere independent of the form factor for fast and optimal results.

Larrivee (Larrivee, 2013, s. 3) states:

"The technology can now address operational objectives like saving time, streamlining processes, cutting costs, and improving time to market."
(Larrivee, 2013, s. 3)

When choosing an ECM system, the customer must know what tools will match their business needs.

Social collaboration functionality can be grouped into: (Larrivee, 2013, s. 3)

- Communication channel facilitation such as chat, instant messaging, whiteboarding, among other things.

- Content lifecycle management responsible for managing the content related to the business processes, and

- Project facilitation responsible for achieving the business goals with the minimal effort for the business users.

The challenging side of knowledge sharing is the restrictions some organizations must account for regarding their collaboration compliance requirements. For some organizations, open collaboration is not always a desired featured on both within and/or outside the organization.

COSTS – ECM systems are complex by nature, which is a synonym of high cost by definition. The question here is what would be the cost of not implementing an ECM system? Often this issue is not measured. The measurement of costs and benefits and the business process speed when using an ECM system can be done, however, they are not always shown on the revenue. Larrivee (Larrivee, 2013, s. 3) argues the costs of loss repeated businesses due to the lack of timely customer service is usually not measured until it becomes an issue. Larrivee (Larrivee, 2013, s. 3) uses a metaphor on the telephone usage as tools that business cannot even think about being without, however, no one has ever studied the ROI (return on investment) of using the telephone. The same analogy could be applied to ECM systems.

CONTINUITY – The importance of a continuity plan.

The continuity of a business is how prepared are organizations to face natural or human-made disasters that disrupt the business activity. ECM systems have the

ability to create repositories to store all the core business information in a centralized way. These repositories require from organizations the need to possess the knowledge of their vital electronic information, in a prioritized way, in order to have a continuity plan, which will allow the organization to access their vital information in case of any disaster occur. (Larrivee, 2013, s. 4)

Larrivee (Larrivee, 2013, s. 4) affirms:

> *"Until you understand what you have, why you have it, and who creates and use it, how can you possibly be effective in managing and maximizing it to your advantage?"*

This section assumed the organization had already built its strategy and was moving into a) Identifying the content assets, b) Map and validate the processes, c) Establish consistency and d) Select the appropriate ECM technologies needed to support organization's goals.

The key question at this stage is what companies should do before deciding which ECM systems to choose: (Larrivee, 2013, s. 5)

- Conduct an information audit to identify what information the organization has,
- Sort through the information found and classify it into structured, semi-structured, and unstructured,
- Identify who creates the information and why,
- Find out if there are duplicates and why,
- Find out how information is used and by whom and as the last step,
- Consolidate and minimize the amount of information from the redundancy risk perspective.

Larrivee (Larrivee, 2013, s. 5) emphasizes the need to understand internal users and external customers.

> *"By understanding how people interact with and how information interrelates with process, you can design your information management environment and processes to be more streamlined for maximum results." (Larrivee, 2013, s. 5)*

The term "information user" is used in this section to identify the person who interacts daily with the organization's information to perform the daily activities. Inquiring users how they prefer to interact with their information and, constantly inquiring on the usability and utility of the new ECM system is crucial to assure the system design was a successful project.

Here are some of the questions Larrivee (Larrivee, 2013, s. 5) presents to be asked from information users a) Can you describe the processes are associated with the organization's information? Have they mapped accurately?, b) How information enter and exit the operational process?, c) Are there bottlenecks in the process related to information? If yes, could the bottlenecks be removed?, How?, e) What the information used to impact the information process?

Larrivee (Larrivee, 2013, s. 5) strongly advises only to manage the core business information. The information usage should be consistent, which means it should be efficient from its creation until its use. Organizational structure, naming conventions and information searchability must be taken into account when planning the ECM system implementation.

Topics to be considered according to Larrivee (Larrivee, 2013, s. 5) are How is information being labeled and grouped?; What is the information, correspondence, contracts, intellectual property; Is there a need for this information to be physical and, if so, what are the reasons?; Who is selecting the terms to be used and the organizational structure for this information?; Is there a better way to capture and organize this information using automation technologies?; What customers should consider when planning to purchase an ECM system?; Where the information will be used for in the present and future perspective?; Will the information be consumed internally, externally or both?; Can structured decision-making elements be automated in the process of information type?; What is the level of system integration that will be used to streamline data flow between systems?

ECM systems contain many technologies. The customers' requirements are the basis of the project, as clear as possible. The customer must have a deep understanding of

their information lifecycle to have a successful ECM system project outcome. Once the ECM system has been implemented, assessment on a yearly basis should be enabled to establish the relevance of the information to the user. Immediately after the project is done, a post-project should be in place. The post-project is the maintenance of ECM system. ECM systems need a full-time administrator that responds to user's requirements and main internal maintainability of the system in order. Many ECM projects fail in the long run due to the lack a full-time administrator. Finally, a business culture that will always keep the information assets and its use as efficient and relevant as possible will contribute to the ECM system success.

4.4   Summary

In a nutshell, Enterprise Content Management (ECM) is a system that can handle multiple tasks and services, such as document and data capture, content management, content sharing, content lifecycle management and business processes. (IDT Choosing an Enterprise Content Management System). However, ECM is a complex system that must have a proper strategy before, during and after its implementation.

It is important customers have an ECM system strategy that takes into consideration the level of their platform understanding and their expected outcome. Customer understanding will raise significantly the ECM solution project success and how significant is the post-development considerations that address issues such as ECM adoption, maintenance, and future scalable needs.

5   Microsoft SharePoint 2013

This chapter gives an overview of what Microsoft SharePoint 2013 is and discusses its features. It touches SharePoint Apps, Office Web Apps, Information Architecture, Social briefly. The literature which this section was based on the online Technology Center of Microsoft knowledge called TechNet and in Riley & White's book "Enterprise Content Management with Microsoft SharePoint." (Riley & White, 2013)

5.1   What is Microsoft SharePoint?

Riley & White (Riley & White, 2013) affirm that Microsoft SharePoint out-of-the-box ECM system is not a solution. They argue that SharePoint is built from features and technologies that can turn into a great ECM solution when customized. They state Microsoft *"SharePoint as a platform, a grab bag of features, and technology that can be molded into a fantastic ECM solution."* This "bag of features" can be noticed in Figure 2 below.
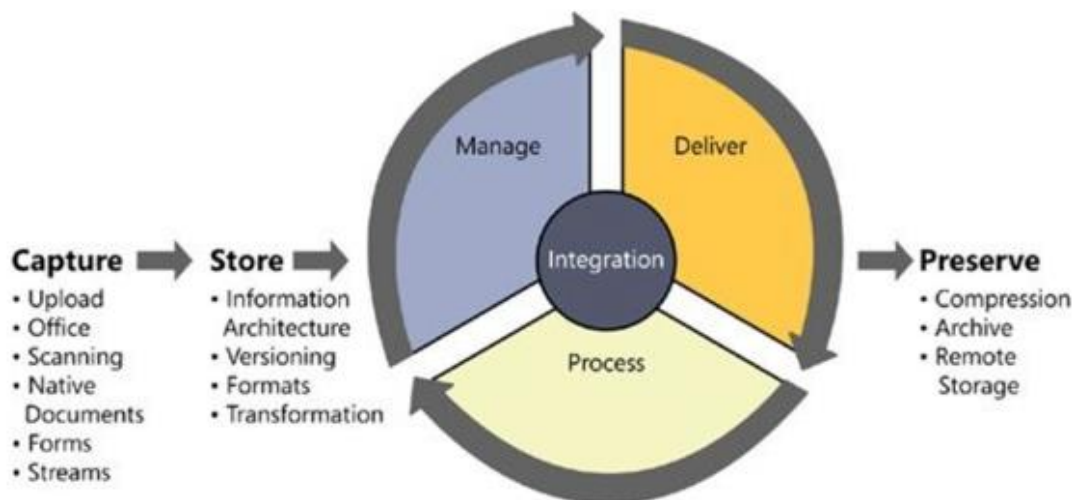
Figure 1-1. ECM stages.

Figure 2: ECM stages (Riley & White, 2013, p. 6)

The central role of Microsoft SharePoint is in Microsoft's Business Productivity Infrastructure, which refers to SharePoint as a place to share ideas and where people can create, organize, discover, build and manage content. (Technet, n/a)

The five key SharePoint principles are Share, Organize, Discover, Build, and Manage.

TechNet refers to these five key points as what SharePoint 2013 is all about.

Figure 3: Top SharePoint benefits (Mindfire Solutions, n/a)

In the PowerPoint presentation about SharePoint 2013 features overview for IT pros Microsoft state (Technet, n/a):

> "SharePoint is the place to share ideas, content and the vision of your company. It's scalable enough to organize and manage all your information assets but it's also designed to organize and store documents to enable personal productivity, keep teams' in sync, and projects on track. It's where you go to discover experts, share knowledge and uncover connections to information and people. It's a hub for developers to build and deploy modern apps and for designers to build eye-catching websites. And because it's built in the cloud in mind, IT Pros can manage cost, and meet the demands of compliance to manage risk. Finally, SharePoint 2013 has been built to handle almost anything our customers can throw at it so IT Pros can spend more time managing information, delivering innovation and manage their time effectively." (Technet, n/a)

5.2   Features Overview

TechNet lists the most important Microsoft SharePoint 2013 features as Create and

organize content easily with the relevant discovered information; Control by managing content policy and processes through information architecture and taxonomy; Protect reducing risks and managing compliance with centralized eDiscovery tools; and Have a discovery center established with a portal through which content can be accessed through searches, place content on hold and export content.

Microsoft TechNet describes the feature of SharePoint 2013 as following Table 2: (Technet, n/a)

Microsoft SharePoint features overview	
1. Create & Organize content	Easily with the relevant discovery information.
2. Control	Managing content policy and process through information architecture and taxonomy.
3. Protect	Reducing risks and managing compliance with centralized eDiscovery tools.
4. Discovery Center	Establishes a portal through which content can be accessed by searches, place content on hold and export content.
5. Team folders seamless integrate with Exchange	Provide the best of both worlds and with end user flexibility.
6. Internet Sites can:	Design with familiar tools
	Publish by creating, reusing and consuming content from any device and language, which provides a way to engage with rich content with adaptive experiences.
7. Web Content Management:	Support the tools and workflows designers use
	Support multi-language and content translation
	SEO (Search Engine Optimization)
	Cross Site Publishing
	Multimedia - video embedding and images
	Clean URLs
	Metadata Navigation
8. Social is better than in earlier version through:	Micro-blogging
	Active Feeds
	Communities sites, where if self-service is enabled, people can create their sites with little effort from templates,
	Discussion boards, and
	Blogs
9. Mobile browsers are now better supported.	Sites are automatically rendered by mobile browsers, including the re-direction for Office Mobile Web Apps (Excel, PowerPoint, and Word).
10. Search architecture is now unified	Provide rich contextual previews and personalized search results based on search history and the refiner panel.
11. Business Intelligence (BI)	Is served through Excel BI and Excel Services, which include Performance Point and Visio Services.

Table 2: TechNet knowledge poster Microsoft SharePoint feature overview (Technet, n/a)

Riley & White (Riley & White, 2013) have a figure in their book that is reproduced below. It explains how they see Microsoft ECM lifecycle components and how content lifecycle aligns to a combination of SharePoint's features.
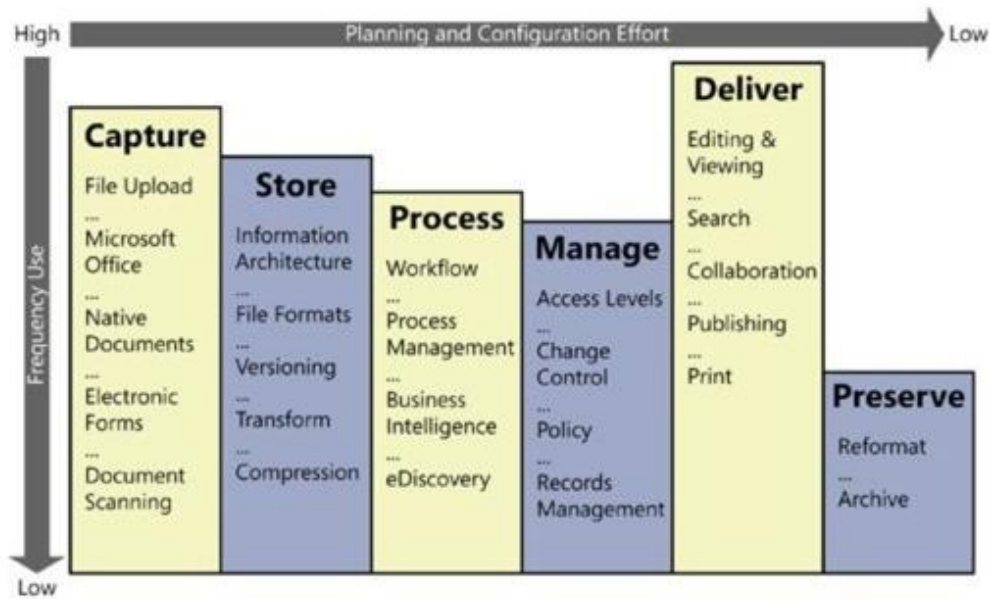
Figure 1-2. ECM life cycle.

Figure 4: ECM lifecycle combination of features (Riley & White, 2013, p. 7)

In the X-axis, Riley & White (Riley & White, 2013) listed the stages in a document lifecycle in order from the most commonly to the least used features. In the Y-axis, each document has been ordered according to the amount of planning and configuration effort each stage should be given. They emphasize the need to go downstream beginning with Capture, followed up by Store, Process, Manage, Deliver and finally to Preserve. The figure describes that what happens at one stage, have a direct impact in how content is searched, identified, delivered and preserved.

According to Riley & White (Riley & White, 2013), SharePoint 2013 is a combination of many components represented in their ECM lifecycle figure above. SharePoint has an extensive list of features that at deployment time may be turned "on" or "off" depending on the customer's needs. Please refer to the table below to an overview of Microsoft SharePoint ECM.

Microsoft SharePoint ECM feature Table Overview	
CAPTURE The second most common way users contribute content to SharePoint. Tagging is an essential part to the ability of find documents when capturing and uploading content. "The process of getting content into SharePoint content databases with the proper security locations and structure, from an existing format…in the form of native SharePoint documents." **(Riley & White, 2013)**	**FILE UPLOAD**
	Need planning. Methods: individual document, multiple documents, from Explorer view and Dragging from source to destination.
	MICROSOFT OFFICE
	The benefit of Microsoft Office standardization is the total integration with SharePoint.
	NATIVE DOCUMENTS
	No need to rely on client Office applications anymore as SharePoint 2013 allows content creation through Office Web browser.
	ELECTRONIC FORMS
	The purpose is to capture structured data from users. Best companion is Microsoft InfoPath.
	DOCUMENT SCANNING
	"…the process of taking physical documents, converting them from paper to digital, and storing them in SharePoint."
STORE	**INFORMATION ARCHITECTURE (IA)**
	Also called logical storage. Needs much planning. It is made of a group of features for organizing content such as Repositories, Metadata Model, Presentation Layer and Taxonomy/Folksonomy.
	FILE FORMATS
	Organizations should check what types of file format they would allow users to upload, read and edit. If the file format is supported by native SharePoint viewing or if they will have proper management tools such as non-native viewers.
	VERSIONING
	"…is the process of storing earlier versions of a document with their associated time and date stamps." It allows users have previous versions of the documents while having a current one in use.
	TRANSFORM
	Transformation or Conversion allows users convert on file format to other. "SharePoint has some built-in conversion functionality for Office documents and hooks to incorporate other transformation processes."
	COMPRESSION
	Used to shrink the size of files before they are archived.
PROCESS Process content requires knowing the technical and functional requirements of what will be built. Best practice is: 1. Interview and observe 2. Process white-boarding 3. Documentation and review	**WORKFLOW**
	"It is a process of routing a content item or transaction through a series of pre-defined steps for approval between the different layers of management."
	PROCESS MANAGEMENT (BPM – business process management)
	"…looks very similar to workflow, but it differs in that it allows for multidirectional processes, the ability to version processes, and change control for processes…it usually comes via third-party solutions."
	BUSINESS INTELLIGENCE
	BI is responsible for make sense of the data into a visually and easy understandable consumable form.
	e-DISCOVERY

	It is a specific type of content processing that is applied to organizations that have to deal with audits and all sort of government compliance policies and laws.
MANAGE It is all about governance, which means the formal and informal policies organizations require by the users to handle information. Including how to be captured, stored, secured and archived and disposed.	**SECURITY & ACCESS (ACCESS LEVELS)**
	SharePoint can manage security at any level. The information architecture should be planned with safety in mind. Security in SharePoint means, "Who has access to what?"
	CHANGE CONTROL
	The process of managing technical and business requirements and environments with the purpose of mitigating adverse impacts on the system are called change control.
	POLICY
	"There are certain elements of governance that can be implemented with technology, some can be carried out with rules, and others could be accomplished with either technology or written rule, so a decision must be made." (Technet, n/a) When we see in SharePoint any metadata that is required by the red asterisk, it has been implemented by policy rules which knowledge workers should be bound to.
	RECORDS MANAGEMENT
	"When a document is declared as record, its will not change, the metadata, such as the last modified data will not change, and its logical and physical storage location will not change." Also, some security to the record is assigned that only authorized people can access it. Records require strict principles such as Record Series, Records declaration, and Retention schedules.
DELIVER Delivery is "…the process of enhancing content with new information or consuming the content already has. This includes editing of existing documents, changing of metadata, and sharing of the content with others" **(Riley & White, 2013)** by search, editing and viewing and publishing.	**EDITING & VIEWING**
	"…An amazing amount of time is spent reading and consuming content as compared to creating it." (Technet, n/a) "…Office suite has the clear advantage of having essentially bundled viewing and editing capabilities with SharePoint, either with client applications or with Office Web Apps. Documents such as PDF, which is predominantly designed for viewing and not editing, have special considerations when it comes to ease of access." (Technet, n/a)
	SEARCH
	"The process of using keywords or Boolean logic to locate content and information." It involves querying the keyword, displaying the results and giving options to refine the results based on user's needs.
	COLLABORATION
	Document collaboration is a feature, which allows multi-users edit the same document at the same time.
	PUBLISHING
	"…is the process of publishing content or allowing content to be pulled, by individuals who are not necessarily the curators, for viewing purposes only."
	PRINT
	Printing nowadays is increasingly paperless. However, printed documents are also very used.
PRESERVE "…preservation is a process of document conversion and movement to another location. Preservation focuses on	**REFORMAT**
	Reformat is a common process when content is being preserved. The document is often converted to PDF or PDA to avoid content edition and the elimination of any additional existent versioning and then compressed.
	ARCHIVE

content that has historical importance to your organization." **(Riley & White, 2013)**	"For archive content, the preference is to see its metadata but not allow the content to take up space in the content databases. This can be done by using tools such as blob storage (RBS):"

Table 3: Microsoft SharePoint ECM feature overview. (Riley & White, 2013, pp. 1,2 and 3) Chapters 1, 2 and 3.

5.3   Responsiveness

Mobile browsers have to start from SharePoint 2013 much better support, as it is recognized at displaying time while sites are being automatically redirected to mobile browsers including Office Mobile Web Apps (Excel, PowerPoint, and Word). See the figure below(Figure 5).
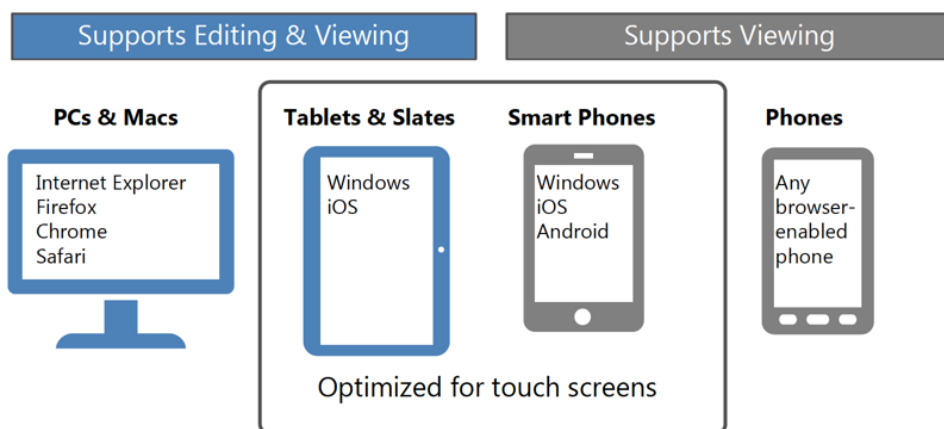
Figure 5: SharePoint support view (Technet, 2013).

Microsoft publicly supports PC's and Macs, however, in the different mobile form factors the supported platforms are Window and iOS for tablets and Windows iOS and Android for smartphones.

5.4   Search

Search architecture is completely integrated and unified in SharePoint 2013 compared to the previous versions. The IA (Information Architecture) now provides a rich content preview and personalized search results based on search history.

Technet (Technet, n/a), points out the following improvements in search capabilities of SharePoint 2013 such as search user interface enhancements, relevance improvements, changes in crawling (indexing), discovering structure and entities in

unstructured content, more flexible search schema, search health reports, and new search architecture. When the search is carefully planned IA using relevant metadata to the customer, the search becomes a very powerful tool that works very well in SharePoint 2013.

The search component interaction includes crawl and component processes, index and query processes and searches administration. According to Technet (Technet, n/a), "the crawl component is responsible for crawling content sources." In other words, it indexes content with their associated metadata using one or more crawl databases that temporarily store information in the content processing component. Index and query processes include a scalable index component, index partition and query processing component that are responsible to writes the received processed items to an index file and provide results set in return to queries. The index partition is a part of the entire search index that is responsible for the logical processing. The query processing component is what analyzes and processes all the search queries and its results. (Technet). The search administration is responsible for storing configuration data, and including search administration component and its corresponding database. (Baer & Patton, 2015)

In Figure 6 below is shown a screenshot of the author's search results page of JAMK Office365 SharePoint online.

Figure 6: Screenshot of the search result pages on JAMK SharePoint 2016 online.

The term searched was "gradu" in the category of "Everything, " and the results
appear below with a short description. The search has four categories Everything,
People, Conversations, and Videos. If Yammer is integrated into the Office365
SharePoint, the user can also search on Yammer by clicking on the "Search on
Yammer" link. On the left side of the page, there are search refiners that help to
refine the search further by clicking on the type of search the user is looking for or by
the author and even by using the slide from "Modified date" to refine the time frame
the user is interested in searching. Finally, when hovering over the search results a
pop-up appears within the page showing what is on the content that also has a sub-
menu Edit, Post, Send and View Library that dynamically change according to the
content, e.g. Word documents can be edited, which is why the edit sub-menu is
available, however, for blog post and PDF documents instead of Edit, the sub-menu
has Open.

5.5   Service Applications

In "SharePoint Server 2013 IT Pro Reviewer Guide," Microsoft affirms the service
application architecture in the 2013 version was designed for information availability
enabling people to access their content in more efficient, and in more formats.
(Microsoft, 2013)

The Service Application pool in SharePoint Server 2013 includes Search, Managed Metadata, User Profile, Excel Services, Access Services, Visio Graphics, Secure Store Services, Business Data Connectivity, Word Automation, Work Management, App Management and Machine Translation. See Figure 6 below.
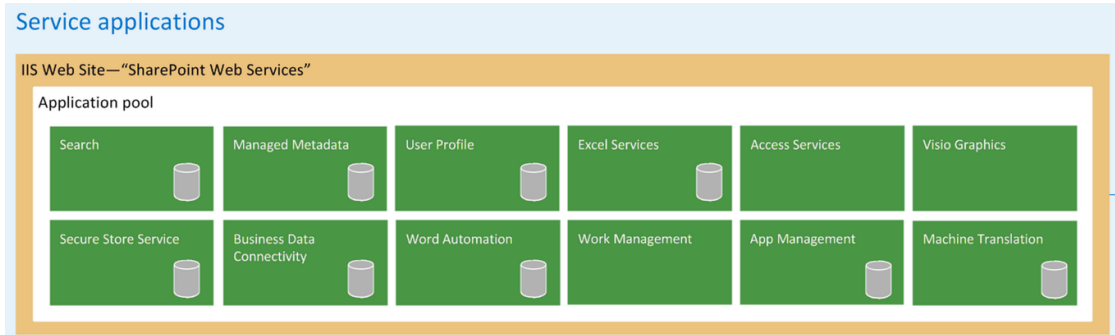
Figure 7: Screenshot of Microsoft SharePoint 2013 poster of Server Architecture (Microsoft Technet, 2013)

Search is a part of the application pool, and it has been reviewed in the last section due to its fundamental importance. Taxonomy and metadata importance have also been examined in the Literature Review section.

The other services SharePoint provides are the following:

- User profile service provides a variety of services ranging from social collaboration to authorization. The user accesses it by importing options from Windows Server Active Directory (AD) domain services synchronization.

Figure 8: User Profile (Microsoft, 2013)

- Work Management provides the user with the ability to edits tasks across various Microsoft Server through Microsoft Exchange, Lync, Project servers that are exposed to "My Tasks SharePoint list." There is a PowerPoint Automation Service, that similar to Work Automation Services, provides the

user with the ability to save their presentations on a variety of formats with the goal of making them more accessible.

- App Management is where applications are made the core to the new SharePoint Server 2013. The goal here is that applications are easy to develop, deploy to the marketplace, monitor and later on it is retire.

- Secure store services refer to the rich security model to help to ensure safety and compliance to organization's policy.

- Business data connectivity services manage the information outside SharePoint Server boundaries. It provides a user with a program interface that helps to read and write data from a variety of external providers.

- Machine Translation or Translation Services are cloud-based translation services able to translate the site and their content. These services have a set of APIs (application program interface), REST(representational state transfer that is client-server cacheable communication protocol), and CSOM (Microsoft generated a collection of libraries to manipulate server-side object model), to support content that is translated when needed by the users.

- Office Web Apps has grown to become a separate product. It serves as a window for viewing and editing documents such as Excel, Access, Word among others from multiple form factors through Microsoft Exchange Server and Lync Server. File servers are accessed with their URL links. They may be cloud integrated through Windows Azure Services. However, one interesting addition is the ability to provide access to a document stored on other platforms such as IBM FileNet, OpenText, and Oracle. (Microsoft, 2013)
  - o Important notice that web-based apps such as Excel, Word, PowerPoint and Visio among others do not have the full capabilities of client base applications.

5.6   Information Architecture

The term Information Architecture (IA) is described by the Information Architecture Institute as "The art and science of organizing and labeling websites, intranets, online

communities, and software to support usability and findability." (The Information Architecture Institute, 2013)

IA is the core of any successful ECM system, and it is described as "the logical storage of content. It includes web applications, site collections, sites, list libraries, and content types," and their relationship with each other regarding the way they are configured. (Riley & White, 2013)

The poster presented in Figure 9 shows that SharePoint 2013 consists of a Logical and a Physical Architecture. The Logical Architecture includes Sites, Service Applications, Databases and Workflow. The Physical Architecture includes SharePoint Server 2013 Farm, which in turn encompasses Office Web Apps Server Farm, the Social Architecture and App management.

The Microsoft SharePoint logical architecture comprises: Sites/Application and Pool/Web Application collaboration sites.
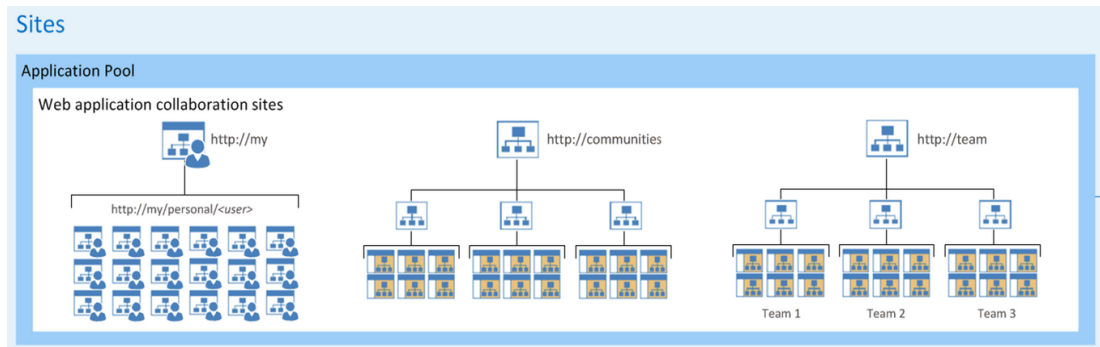
Figure 9: Screenshot of the poster of Microsoft SharePoint 2013 Server Architecture ((Microsoft Technet, 2013)

In Microsoft SharePoint, the information management is accessed by the people who has access to it. The key roles and responsibilities are shown in the screenshot in the table below.

Table 1-1. Roles and responsibilities of key individuals

Users	Technical	Management	Governance
Knowledge Workers	IT Operations	Executive	Records
	Developers	Departmental	Legal
	Business Analyst	Project	Procurement

Table 4: Roles and responsibilities of key individuals. (Riley & White, 2013)

SharePoint information architecture is often confused with its individual components and that few organizations know what SharePoint information architecture is (Riley & White, 2013). One important distinction should be made about the difference between Structure Content and Unstructured Content. The former can be described as any information that can be used to create lists and tables and classified information in a structured way. The latter is constituted the tacit knowledge, and the written knowledge generated by information that is impossible to organize structurally.

Riley & White (Riley & White, 2013) present us in the figure below with a visualization of all SharePoint information architecture aspects.
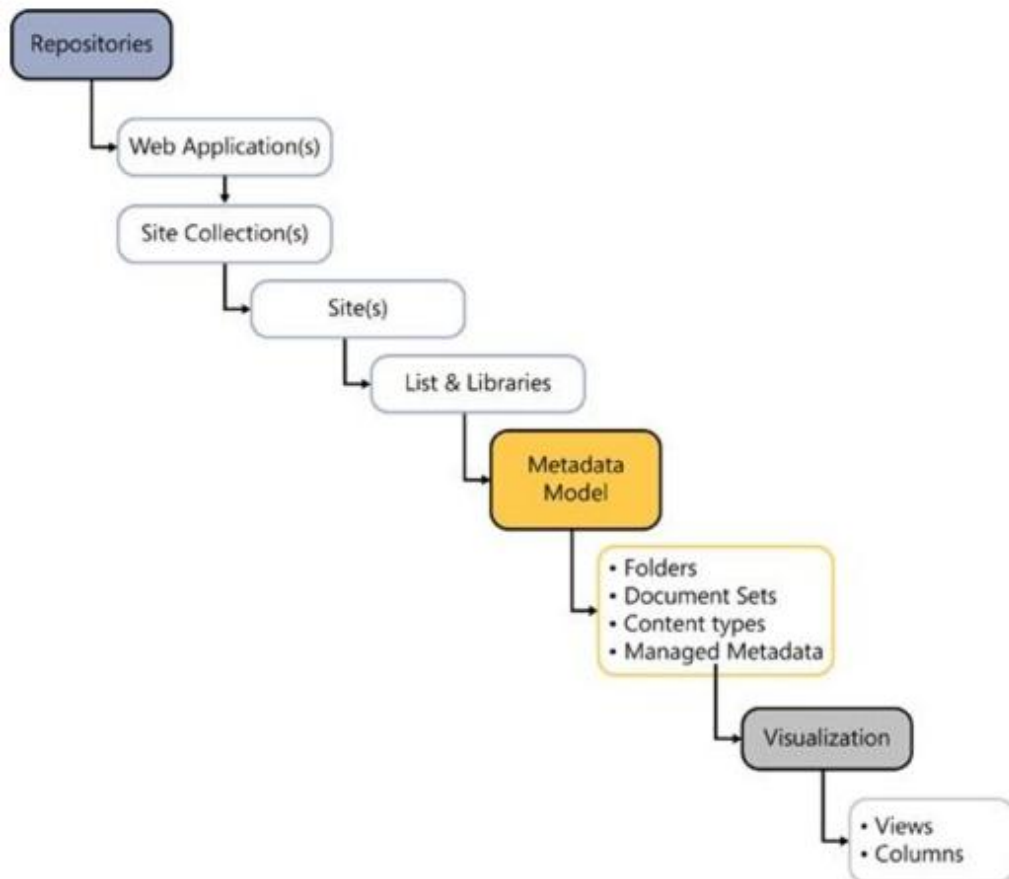
Figure 1-3. Information Architecture.

Figure 10: information architecture graphic. (Riley & White, 2013, p. 13)

This Figure 10 above shows a hierarchical order of the content storage and how the metadata is represented. The repository part of the information architecture should use metadata (data about the data) as the right way to flatter information architecture, making it multidimensional and flexible to be easily searched (Riley & White). The main point, in this case, seems to be, that in the field of information technology folders, as it is known, are used to use to organize information in a findable and structured way, in reality, are not optimal for content search at all. In SharePoint, the information architecture should thrive to use metadata and content types as a way to identify the content properly. (Riley & White).

Table 2-1. SharePoint Information Architecture components

Repositories	Metadata Model	Taxonomy/Folksonomy	Presentation Layer
Web Applications	Content Types	Managed Metadata	Columns
Site collections	Content Type Publishing	Rating	Views
Sites	Folders	Like	Navigation
Libraries	Information Management Policies		
	File Naming		
	Versioning		
	Document IDs		

Table 5: SharePoint information architecture components. (Riley & White, 2013)

The table above from Riley & White's book (Riley & White, 2013) show how the information is structured in SharePoint 2013 and that it is all about repositories. Repositories are containers to the sites and libraries, taxonomy and metadata to give information meanings and make them "findable" and the way SharePoint present the information.

In summary, this metadata driven tendency to logically structured information has also been seen in recent updates of Apple's proprietary system iOS and for Microsoft proprietary Windows platform computers. The use of "tags" to label content to help in their "findability" and easy access is now becoming the industry standard for computer platforms.

5.7   Social Networking

Microsoft SharePoint 2013 started with new social features that make this ECM platform even more appealing to the customers. The new features are the ones who lack in the previous version and now are included out-of-the-box (OOB). These features are rich user profile, personalization, threaded conversations, alerts and

network notifications, status updates, network details, newsfeeds and rich media sharing. (Microsoft Technet, 2013)

The platform has been redesigned compared to the version 2010 to highlight the user experience and intuitiveness of the interface which intends to appeal for users that are used to modern social media features. (Microsoft Technet, 2013)

TechNet has a poster of "Social feature support in SharePoint Server 2013" that depicts well the social features SharePoint 2013 provides for both single and multi-farm. (Microsoft Technet, 2013). The farm is a term Microsoft use meaning server. SharePoint when in production it consists of a set of farms, one for each job. The User Profile Server application, the My Sites host, My Sites personal site collections, and the team sites are all located on one farm. (Microsoft Technet, 2013)

Microsoft SharePoint Social Features	
My Sites	The personal page where the user can store personal private or public documents, build their network and promote their skills and profile.
	Micro-blogging, newsfeed, and @Mention is part of My Sites.
	#(Hash)tagging
	"Like" concept from threads and posts
	@Mention
	Following capabilities (Sites/Users/Documents)
	Updates from people the user is following
	Recommendations for people/sites to follow
	Post images and links
	The term "The Feed" is becoming known for been the content generated by users via the micro-blogging features in combination with the system generated content (birthdays, promotions, notifications of social activity, etc.)
	Multiple feeds differ from document feed, such as Newsfeed, Everyone (display only activities from people the user is following), Activities (show all content tied to the user including the system generated and display in the "About me" page), Mentions (all activities the user has been tagged), and Likes.
Community Sites and Community Portals	Forum experience site. Have their community template, which helps to organize and streamline discussions. It provides moderation, participation rewards through reputation systems, and visible feedback on the value of posts.

Table 6: Table adapted from Craig Butler's blog, (Grubic, 2013)

Microsoft SharePoint Social Limitations	
The "everyone" feed is always public, and no security trimming is applied.	Only through a site people can share content privately,
Reputation and gifted badges are site specific	Other communities do not recognize and do not exchange reputation and gifted badges.
Social activity is only exchanged between sites and users in the same farm	It might become an issue for bigger and complex organizations' deployment.
Limitations on the OOB (out-of-the-box) SharePoint	Users can configure notification and what activities they want to share. However there is no option to receive notifications of activities through e-mail
	SharePoint has a smartphone optimized view. However there is no dedicated social or activity view for mobile or tablets
	There is no desktop app
	There is no tool for reporting specifically on social activity.
	The tagging experience feels incomplete compared with other enterprise social networking solutions.

Table 7: Table adapted from James Dellow's article (Dellow, 2012)

James Dellow (Dellow, 2012) affirms that although SharePoint 2013 has many social improvements, it is still a document-centric platform with some user experience challenges. He points out customers when choosing Microsoft SharePoint are mostly attracted to the document content management capabilities however what they want are the powerful and efficient social network. When the project is deployed and working, and this happens, it means customers will have to invest effort and money in SharePoint governance customization by acquiring extensions such as Sitrion One. Sitrion One purchased Newsgator which was a plugin for SharePoint that incorporate powerful social features into SharePoint. Nowadays Sitrion One offers mobile app productive stream that is seamlessly incorporated to SharePoint, SAP, and SalesForce. Another way to complement the social network functionality that SharePoint lack is by integrating other solutions into SharePoint such as Microsoft

Yammer or IBM Connections plugin. (Dellow, 2012)

In "SharePoint Server 2013 IT Pro Reviewer Guide" marketing document, Microsoft states: (Microsoft, 2013)

> *"Social Computing and collaboration enable people to work in ways that are familiar to them, but as social computing becomes more pervasive, more demand is put on the supporting infrastructure. To keep up with these demands, social computing data is now stored in the content database where personal sites are hosted, providing a method to scale horizontally in parallel with demand." (Microsoft, 2013)*

Microsoft affirms that information is at the core of SharePoint Server, which explains why they make an effort to make information available to multiple formats. (Microsoft, 2013). Although many social improvements have been made to SharePoint 2013 to keep up with the social network trends, the platform vision makes clear that information accessibility is what drives collaboration. (Microsoft, 2013).

To fill the lack of an effective Social network to SharePoint OOB, Microsoft itself has purchased Yammer that is a client application for desktop and mobile that allow users to share documents, tags them, comment and chat. Yammer is a social application driven solution that is capable to dramatically improve the social capabilities of SharePoint when it is integrated into this ECM system. Although Yammer belongs to Microsoft, it is still considered a third party solution because it has to be purchased separately through on-premises. In chapter 6 the author goes through Microsoft SharePoint 2016, SharePoint cloud online and all the effort Microsoft is making a difference with one cloud solution.

Yammer and Sitrion One application and IBM Connections plugin are some of the third parties that seamlessly can be integrated with SharePoint providing all the social network features needed.

5.8   Skype for Business (former Microsoft Lync Server)

Microsoft Server Lync in 2016 version is now Skype for Business. Lync features in Skype can be recognized for being easy to find and connect with co-workers and the mobile access. Skype features are familiar to Lync users. However, with a new simplified interface controls such as a) New look and feel, b) Call from Skype for business using desktop phone for audio, c) Call monitor, d) Rate My Call, e) Quick access to call controls and, f) Emoticons. (Office, 2015)

The two drivers for Skype for Business are a) The "Global Reach" for voice and video connectivity, b) Full Lync feature and functionality into Skype for Business. Skype for business change Lync 2016 clients to Skye for Business clients, Lync Web app to Skype for Business web app, Lync admin center to Skype for Business admin center and Lync online to Skype for Business online. (Office, 2015)

5.9   Microsoft Yammer

Microsoft has announced in June 2012 that had acquired Yammer to deliver the social features Microsoft products lack.
TechNet refers to yammer as:

> *"best-in-class, secure, and private enterprise social network." It is available as "…stand-alone product, basic or enterprise, or as part of Office 365 for professionals and small businesses or SharePoint Online. Yammer can be integrated into SharePoint Server 2013 or SharePoint Server 2010, or with Office 365 or SharePoint Online environment". (Technet, 2015)*

It is important to mention that Yammer is a cloud-based platform and only works when the user is online. Yammer mobile app works currently for Windows, Mac, and Android OS. Below in Table 8, there is a table of Yammer capabilities compared to SharePoint and Office 365:

	SharePoint	Yammer	Office 365
Announcements	Post communications to blogs to share with the whole organization or specific teams.	Share announcements with the organization or specific groups. Pin announcements for easy discovery.	All of the capabilities of SharePoint and Yammer.
Discussions	Post ideas and discuss information and projects in lists and communities. Categorize discussions so you can find what's relevant. Moderate communities to highlight featured discussions or set community standards.	Discuss information and projects in groups. Use @mentions to draw people's attention to specific information or to request more information. Use topic tags to make related discussions discoverable.	All of the capabilities of SharePoint and Yammer.
Files and documents	Store files and documents in libraries and OneDrive for Business. Use versioning and check in and out capabilities, and know exactly who's updated the document.	Share and discuss files and documents. Mark approved files as "Official." Use @mentions to include people who could contribute to or review the document. Collaborate on files stored in OneDrive for Business.	All of the capabilities of SharePoint and Yammer, plus ability to read, edit, and track changes to documents with Office Online or the Office client applications. Includes OneDrive for Business.
People and groups	Organize information, documents, schedules, and tasks for a group of people with team sites. Control access with permissions.	Create groups for projects, teams, or interests. Keep stakeholders and interested parties informed by using public groups. Protect sensitive information or projects by using private groups.	All of the capabilities of SharePoint and Yammer.
Outside your organization	Use extranet sites to coordinate projects with partners and vendors.	Use external networks to communicate and collaborate with partners or customers.	All of the capabilities of SharePoint and Yammer.
Analyze	Use business intelligence features to analyze data from SharePoint or external data sources. Track site usage and statistics and improve over time.	Analyze and track engagement. Find and publicize successes. Use data to improve processes and connections across the organization.	All of the capabilities of SharePoint and Yammer.

Table 8: Screenshot of Microsoft poster SharePoint-Yammer-Office365 features comparison. (Technet, 2015)

The Table 8 shows, all the SharePoint social capabilities OOB are enhanced with Yammer social extended capabilities to announcements, discussions, Files, and Documents, people and groups for both within and outside the user's organization, and analyze tools.

The social features of Microsoft SharePoint 2013 have improved considerably compared to earlier 2010 version. Microsoft acknowledges that Yammer completes SharePoint, which means they understand SharePoint is an information/document-centered platform that needs their social features extended.

5.10   Skype for Business vs. Yammer

In this section, the author has used a website called G2 Crowd, which does business software reviews for many IT categories. G2 Crowd as a researcher uses internet research questionnaire available for anyone to take. This fact makes G2 Crowd less of an academic researcher and more as a general research body that does not have an international and strategic vision compared to others research bodies used in this

paper.

Figure 11: Skype for Business vs. Yammer. Source (G2 Crowd, n/a)

In Figure 11 above shows that G2 Crowd has received 120 reviews for Skype for Business and Yammer only 50 reviews. Skype for Business overall gets four stars rating compared with Yammer with three stars rating. The topic "Meets Requirements" for Skype for Business got 45% of the total reviewers the maximum score while Yammer got about half. Disclaimer, as the number of reviewers, is not the same, the author supposes the accuracy of the reviews might have had a different score if they had been done equally. (G2 Crowd, n/a)

5.11   Four reasons SharePoint projects fails article

Wendy Neal has written an online article in the CMSWIRE web page about the four common reasons SharePoint project fails. Although the article was written about the

Microsoft SharePoint, it applies to all ECM system. As a matter of fact, to any IT system implementation. Below are the most important points of Neal articles. (Neal, 2014)

Neal (Neal, 2014) is a consultant responsible for answering to customers when they call for help. She affirms that SharePoint implementations fail for the following three reasons a) The user, or information user, did not adopt the implemented features, b) The organization did not understand all the content and business processes they created, and c) Organizations never implemented it to be used by the information users in a way they would understand and use the platform.

To understand the reasons why implementation problems happen in SharePoint, Neal (Neal, 2014) inquired her customers, and the follow list is the result of her inquiry:

1. Lack of vision or clear plan

   Without a proper plan SharePoint implementation has a high risk to fail as organizations assume after installing SharePoint, end-users are just going to start to use the system without any training.

2. Lack of time and resources

   When organizations plan an ECM system implementation, they should define the in-house resources. The in-house resources are usually one or two people designated to be the facilitators of the new ECM system usage. They are the people responsible for maintaining the system in the long run.

3. Lack of adoption or change management plan

   When new ECM system implementation does not acknowledge that people within organizations have different ways to perform their daily tasks, people's commitment to the new ECM system is compromised. Customers are not aware of the time needed to perform in-house ECM system implementation and maintenance. This lack of knowledge leads to users continue to perform their daily tasks their usual old ways alongside that trying to use the new ECM system or even giving up trying on to use the new system completely.

4. Inadequate user training

   How ECM system is used is the key point. If it is a new system and people

have not worked with it before, training is a must. Neal (Neal, 2014) says:

> *"…it's best to provide live classroom training along with some kind of supplemented materials - such as written materials or videos - that users can refer back later to reinforce what they learned in the live training."* *(Neal, 2014)*

Without proper training, information users are left alone to learn how to use the ECM system by themselves. It becomes a burden to perform their daily tasks efficiently and taking the time to find out how to use the new tool. Human beings tend to do what they feel more comfortable doing, and this is the main reason why proper training is a must have.

5.12   Summary

Microsoft SharePoint is an ECM system that excels as a document management platform. It has powerful features that any information-driven company would find attractive. The addition brought e.g. responsiveness, mobility and the lightweight social networking capabilities that make Microsoft SharePoint an appealing ECM system for customers whose primarily concern is not social innovation, knowledge, and product networking.

Search in SharePoint is powerful and intuitive with refiners on the left side and viewer pop-up that show content with a sub-menu that helps users to navigate to the content if needed right from the search results page. Service applications expose available services in SharePoint 2013 including search, manage metadata, user profile, office365 Web Apps, security, business data connectivity and app management. Information Architecture(IA) exposes SharePoint's logical architecture along with how it is structured from the user's roles and responsibilities. As SharePoint excels as a document management system, the permission roles to view and edit content gets to a top level in importance.

SharePoint Social features have been enhanced. However, SharePoint still needs

Yammer and/or Skype for Business or other social application behind it to elevate its social features to a decent level. IBM Connections' plugin is useless to SharePoint if the organization does not have IBM Connections application installed.

SharePoint is a multi-faceted product that needs proper planning. It must be tailored to organizations' needs. Information users need training and the platform needs constant maintenance for success.

6 Microsoft SharePoint 2016 and SharePoint Online

This section goes through the new features of SharePoint Server 2016 and SharePoint Online to be found at Microsoft TechNet site.

6.1 New Features Overview

The new improvements in the 2016 version are improved end-user features, infrastructure, performance, and compliance features. Small changes to the user interface in the document libraries in OneDrive make it easier to upload, manage and share documents. The next gen is the name given to portals that have support for hybrid environments, including the hybrid picker wizard tool. Finally, the new SharePoint Online features are now included in SharePoint Server 2016. (Microsoft TechNet, 2016)

Microsoft has made SharePoint more complex with multiple products using the SharePoint name. There have been various versions of SharePoint since SharePoint 2000, however, in SharePoint 2016 goodbye is said to some SharePoint products and welcome is done to others. SharePoint 2016 says goodbye to the free and most widely distributed version of SharePoint that is SharePoint Foundation that has been discontinued in the 2016 SharePoint release. (Microsoft TechNet, 2016)

It is very easy to think of SharePoint Server products as a single, integrated platform

that can be hosted in two different locations, on-premises and the cloud. The On-premises is installed on the organization's servers whether those are physical blades in a server room or virtual servers. There are two versions of SharePoint Server, the Standard and Enterprise edition. The Standard includes the core capabilities of SharePoint that allow users to create sites, have collaborative communities, share content, content management, search, etc. The enterprise edition costs more per user, however, in addition to the standard edition features, it includes advanced search, business solutions, business intelligence, services that extend the capabilities of SharePoint. SharePoint Online is the Microsoft-hosted version of SharePoint that is included in Office 365 plan. In the online version, there is no distinction of standard or enterprise. However, it has several different plans that mirror the ones on-premises. There is also SharePoint Designer software which is still the 2013 edition that is part of the Office family. The differences that stand out from online and on-premises are great features such as the next-generation portals such as Delve and Video portals and the new Forms, Planner, Dynamics 365, PowerApps and Flow that are only available in SharePoint Online. (Microsoft TechNet, 2016)

6.2   What Has Been Deprecated?

Deprecated means the feature is still there hanging around. However, it is going to go away at some point as there is no future upgrade path for that particular feature. Deprecated or removed from SharePoint in this 2016 version are: (Microsoft TechNet, 2016)

1. SharePoint Foundation was completely removed. There are many micro and small organizations still using SharePoint Foundation, which means Microsoft expect these free users will have to upgrade in the future if they want to continue use SharePoint. If the organization strategy was to upgrade SharePoint Foundation along with their Windows, it means they will have to search for another ECM solution.

2. The Tags and Notes features in SharePoint were also completely removed. These were features used by organization users, e.g. when upgrading to SharePoint Server 2016, the organization's users made use of tags and notes, when upgrading they will not be available anymore. In other words,

companies building customizations and apps using tags and notes will have an unpleasant surprise.

3. Excel Services are no longer being hosted in SharePoint. Instead, they are being hosted on an Office Online server; a new server is replacing Office Web App Server. The implications of the deprecation of Excel Services hosted in SharePoint is that trusted data providers and trusted file locations would not be supported in the new environment. It means that if an organization has built trusted data connection libraries in 2013 it will no longer be available in the future. Trusted data providers, file locations, or connection libraries will not be available in 2016 version at all.

4. PowerShell commands for Excel services that are used by farm administrators will not be available. An example would be: if the organization need to run Office Online, they will need to have Excel Online available to view Excel spreadsheets or edit them in a browser. They will also need to have Excel Online to use Excel Web Access web part for SharePoint.

5. Some features that have been fully removed and will touch farm administrators are:

   - FIM (Foreign Identity Manager client) – a synchronized Active directory with SharePoint. Instead of FIM, now, there are some third-party tools that will be available for farm administrators. In the next future, Microsoft will have identity a manager 2016 tool that will allow this kind of synchronizations.

   - The stsadm.exe tool is from the old SharePoint team sites. It is an administrative hack tool that farm admins used instead of PowerShell.

6.3   Changes to the User Interface and New Features

The only way the user can tell if they are using Office 365 SharePoint compared with on-premises SharePoint 2016 UI interface is that online in the top navigation states "Office 365". The UI changes are already noticeable if organizations use Office 365 online. The App Launcher in the top left corner is now a Waffle. When it is clicked, it shows the applications available for use. It is customizable by the organization which

is part of the power of the app launcher Waffle. The top navigation name "Sites," when the user clicks on the name it redirects to what was called before as "MySite" in earlier versions. The SharePoint Documents and OneDrive have the same navigation. If the user knows how to upload, create new and synchronize documents in OneDrive, they will also know how to use SharePoint Documents. As a new feature to Sites (MySite) is the ability to "Pin to top" a site the user is following. This feature comes in handy when the user is following many sites at once. The pin to top helps to make the most relevant stand out pushing it to the top of the list.

An important and significant upgrade is the upload size limit for files. In SharePoint 2013 the upload limit was two gigabytes. In SharePoint 2016 the limit is now ten gigabytes. The default storage size for SharePoint Online users is different, and for many users, it means there is access to more storage size.

Sharing a site is very easy in SharePoint. Just click on the sub menu "SHARE" link and choose whom to share. In the same window that appears when the user clicks on the share link, there is "Shared with lots of people" that when clicked it shows within the window all the people that already have the permission to the site. This feature comes in handy when the user does not remember if the site already has been shared with a particular person. There is also an option to "Email everyone" from which the user can e-mail all the people who have access to that site at once. To share a document the user just selected and click on the share link on the navigation menu for SharePoint Documents.

When uploading Documents by browsing a document in Windows, by right-clicking on many documents at once, it is possible to upload multiple files. That was not feasible before. Now short-keys to operate on SharePoint and Office 365 are available. An example of this is: when creating a new document (Alt + n) creates a new file and in a dialog the user choose the type of file to be created. To upload a document the short-key is (alt + u). To synchronize a document the short-key is (alt + y). To manage document, the short-key is (alt + m). To share a document the short-key is (alt + s) and to edit a document the short-key is (alt + e). Many other file formats that were not before supported as documents in SharePoint are now

supported such as open document format (ODF) files, something like Google Docs, or a LibreOffice Doc and Zohon Office Suite document. When right clicking in a document without selecting it, now it, there is now a suitable menu option that was not possible before.

In the past, SharePoint had a restriction with some long name documents or names with special characters. In SharePoint new version some special characters are allowed as well as GUID in filenames and filenames longer than 128 characters.

A useful feature in this new 2016 SharePoint version is durable links. The durable link means the document has an ID (identity) link. When the user renames or moves a document to another site or place, as long as it stays in the same site collection the link does not break as before. The document when clicked it opens in a URL, however, this URL is not the durable link. The durable link can be reached only when the user clicks on the three dots (…) to preview the document. In the preview dialog box, the user can find "navigation link." (Microsoft, 2013) The URL that shows in "navigation link" is the durable link because it uses the document ID. That is the link that should be shared. In the right side of durable link, there is an icon that when the user hovers over it says: "Open this link on the phone". Once the user clicks on that icon, it generates a QR code that can be published on emails or any other applications and sites to lead people to the document the user is sharing.

In OneDrive for business, there are some new features as well, such as the left navigation "Shared with me" that shows all the documents that have been shared with the user. The "Site folders" show the document libraries of the sites the user is following, and the last is "Recycle bin," that when users delete files, they are placed first in the recycle bin instead of being removed forever allowing the user to recover the document if deleted by error.

Office Delve is one of the new-generation portals for document discovery tools that lets users find, and serve information. Office Graph is what drives office Delve is a huge array of information. It looks within the organization that shares documents, who is on teams together and what types of topics are different people discussing.

Then, it uses all this information from Office Graph to provide the user with information that would probably be the most likely relevant to them. Delve was code named "Oslo" when it was in the development phase. Even though Delve is a desktop portal, it is the interface for searching both OneDrive and SharePoint when the user is working on an iPhone or Android. Delve does not modify any permissions; it works within the SharePoint permissions. There is a search box on the right left of Delve site that allows users to search for any topic, and the search results are fast. Once a particular information is found within Delve the user can add the information to a document group called Board, which works as a folder or a group of information that has the same name relevance to the user. In each box of information, there is a star on the top left that when clicked that information is brought to favorites making it very easy to be accessed by the right navigation. When the user searches for people, it appears in the Delve People's section. The Delve People's section shows to the user all the people it has been searched, or it makes them available for easy contact. For example, when the user clicks on a person, it shows the documents that person has been working and the links for e-mailing and Skype chat with that person. When the user adds more and more information to Delve, it starts to build a home page to the user. If the user is working in a hybrid environment, the user can use Delve all the way across the SharePoint experience. If the user only has Office 365 and SharePoint online, it will be able to use Delve only in that environment.

Office Video is a portal that stores and presents videos. This portal is for videos only, and the user can create different channels for their various video categories. The channel settings give the user options of change color and channel name showing. Who has permissions to edit and view and show the download link for videos to owner, editors, and viewers that have previously been established. The user can also spotlight some videos and, lastly, allow Yammer conversations for that particular channel. The videos can be viewed on the browser giving the owner the options to download, embed or email the video. The statistics are also available on the site.

Next-Generation portals are built around common activities that many businesses need to do, and Microsoft is committed to continuing developing new portals across the next two years.
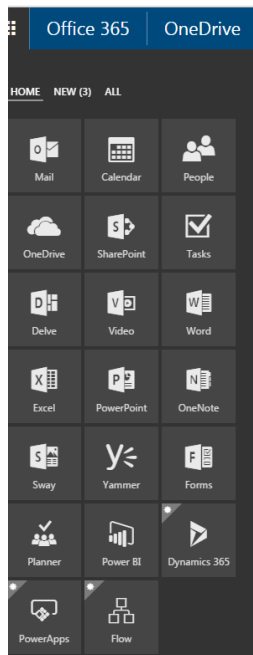
Figure 12: Office 365 screenshot icons under waffle

Next-gen portals are designed to be social, and it is all about the idea of collaboration and mobility, which means the responsive design is built in. No matter if the user is on a desktop or a smartphone, the sites will look as good as they would look on a desktop. The next-gen portals are Delve that is people and document centric; Video that is media centric and; Infopedia that was built to be a knowledge management platform for the organization. The appeal of next-gen portals is that they are ready to go once they are turned on.

6.4   Hybrid Environment

In the hybrid environment, the user gets unified sites lists where everything is in one place. OneDrive redirection means that if the user is working on-premises and click on OneDrive, the user will be redirected to Office 365 OneDrive for business, in which everything is one place. In the mobile environment, it is possible also to have

the OneDrive Mobile app to switch from the Business OneDrive onto the Personal OneDrive if the user has one. SharePoint 2016 can now be configured to mobile devices, and it will look and be useful to the user in the same way as if the user was using only desktop just by activating the Mobile Browser view in the Site Settings.

Unified search, means that the results searched in Office 365 return from both on-premises and online as a whole, while if the user is searching only on-premises the results are only from on-premises. All hybrid possibilities are configurable with a tool called Hybrid picker Wizard.

The performance improvements to SharePoint 2016 are MinRoles, improved patching with zero downtime that uses incremental patches, automatic indexing, and fast site creation. MinRoles are defined as server roles that improve the process for patching, automatic indexing, and fast site collection creation. As most SharePoint farms have multiple servers, when using MinRole features, SharePoint administrators can define individual roles for different servers within the farm topology. It allows SharePoint to automatically reconfigure the services available on each server, based on the function of the server. The server roles are front-end, which is used for service applications, services, and components that deliver requests back to users. Application servers serve as back-end requests, such as jobs that are coming from SQL or workflows. These servers are optimized for very high throughput. Finally, there is no standalone in stall mode anymore because it has been deprecated. Instead, the administrators now have the ability to set up what is called a single-server farm that uses one machine, and it is meant for very limited use in production in micro organizations.

Compliance improvements are in-place holds, data loss prevention (DLP) and document and site deletion policies. In-place hold means when there is a policy to be held, it cannot be deleted and rather than removed to archive to another site, the hold will be put onto an in-place where the user experience for that emails and documents do not change. It was available before only in Office 365. However it is now also in SharePoint 2016 on-premises. Data loss prevention (DLP) is all about ensuring user to deny access to sensitive information to users that should not have

access to that information. Compliance also gives the ability to set policies for document deletion and even for site and template deletion. Microsoft SharePoint enterprise search is used to look for patterns and identify what the user should have access to and what should be trimmed from their sight. There are more than fifty types of sensitive data that are built-in to the new data loss DLP system in SharePoint 2016.

In the eDiscovery Center site, the user has In-Place hold, search & export, however, they begin by creating a new case for sensitive data the organization wants to monitor. New specialized centers for compliance includes Compliance Center, In-Place Hold Center, and Document Deletion Policy Center.

In Office 365 there is a new Protection Center that is being launched, and in the Compliance Center there is a new link the user have access to check the new Protection Center, which deals with data management, secure by design, search & investigate, etc. (Microsoft TechNet, 2016)

6.5   Summary

SharePoint on-premises Server 2016 and SharePoint Designer are products that organizations install on their servers. There is no new 2016 version of SharePoint Designer. SharePoint 2016 Server is used to customize SharePoint to create and customize sites, to work with forms, to build workflows, to brand SharePoint sites, etc. (Microsoft TechNet, 2016)

A growing number of organizations are running SharePoint in a hybrid environment, which means they are using both on-premises and online at the same time. SharePoint 2016 was designed for this mixed hybrid environment, and there is increased support for hybridization being added on a regular basis. SharePoint 2016 emerged in the cloud, and it is committed to future versions of SharePoint Server on-premises. SharePoint Online will still continue to evolve with new features with regularity. (Microsoft TechNet, 2016)

Features deprecated or removed are: a) Excel Services, b) Trusted data providers and

file locations, c) Trusted data connection libraries, d) PowerShell commands for Excel Services, e) Browser-based viewing and editing, f) Excel Web Access web part for SharePoint. Removed for farm administrators is g) FIM (Foreign Identity Manager client), and h) stsadm.exe that has been deprecated.

Many subtle changes in the UI (User Interface) were done, which makes a difference in the user experience and performance. Hybrid Environment is the way to go to many large enterprises that need to ensure that all their data is not out of their servers. (Microsoft TechNet, 2016)

SharePoint 2016 mobile now can be configured to look and behave to be as useful in the mobile as it is on the desktop. (Microsoft TechNet, 2016)

SharePoint 2016 was born in the cloud, and it is the summary of everything Microsoft have learned from the online experience that users want and pulled down to the on-premises servers' version. In summary, SharePoint Server 2016 was born in the cloud. However, SharePoint Online continues living in the cloud and evolving with changes on a regular basis with constantly new features that enable Microsoft to have a continuing learning process. (Microsoft TechNet, 2016)

7   IBM Connections Suite

The goal of this section is to examine IBM Connections version 5. This chapter is focused on an overview of what IBM Connections, what Connections offers to its customers, alongside with its main features. (IBM, 2016)

IBM documentation can be found at IBM Knowledge Center site and IBM greenhouse.lotus.com (Center, n/a). IBM Greenhouse Lotus offers for registered users, video tutorials, and cloud demos just with a click on the green launch button on the top right side of the page. The very positive aspect of Greenhouse Lotus demo is the ability to test on the cloud how IBM Connections feel like and what the

features it offers are right in the users' browsers. Some parts of this paper have been sliced and uploaded to Greenhouse Connections community for evaluation and acquiring insights from experts. IBM Connections seems to be poorly represented publically compared to how SharePoint content is shared by Microsoft for whoever searches for SharePoint information. Even books that go through an overview of the most recent platforms of IBM Connections, including recent earlier versions, are rare to find. Finally is worth mentioning that reliable information about IBM Connections outside IBM sites are only found from few IBM evangelists and dealers who seem to have an interest to share a review guide and some presentations at SlideShare website, few blogs and private owned site named ibmconnections.com. (Benitez, 2014)

7.1   What is IBM Connections

IBM Knowledge Center describes IBM Connections as

> *"…social networking software designed for the workplace. Its features help you to establish dynamic networks that connect you to the people and information you need to achieve your business goals." (IBM, 2016)*

IBM Connections refers to itself as a suite of applications. Its main purpose is to help knowledge works within organizations to focus on their full social potential. Connections give to knowledge work the tools is needed to build a strong relationship with the relevant people while sharing the essential information necessary for success in their daily activities, from both office and mobile. It is a security-rich collaboration platform that works on both software-as-a-service (SaaS), on-premises, and hybrid environments. It gives users flexible, ready-to-use collaboration features. (Forrester total Economic Impact Study, 2015)
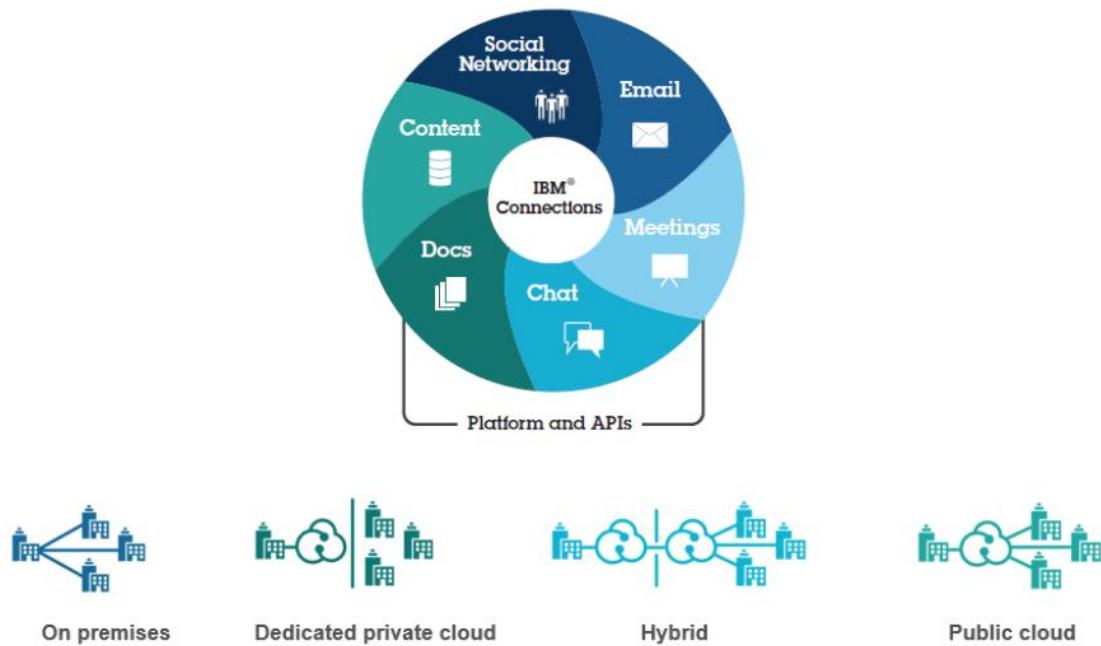
Figure 13: Source IBM commissioned paper by Forrester. The Total Economic Impact Of IBM Connections, p.15. (Forrester total Economic Impact Study, 2015)

The Connections vision is:

- Empower people anywhere and in any situation including mobile, the web, desktop and even offline.
- Engage people by making what matters stand-out
- Trust people by making the collaboration between customer and partners safe
- Extend technology by interacting with third-party applications through an open API and the IBM Social Business Toolkit(SDK).

The new Connections V 5 focus on the ability organizations should have to work with customer and business partners on projects. Relevant content is more accessible than ever to external users, such as customers and business partners that can be invited to share files and participate in IBM Connections communities. Communities have been opened to external users, and the users are the ones who have the power to take action quickly on the relevant content and network relationship they need to succeed. IBM Connections can be deployed on-premises, hybrid and in the cloud. (Forrester total Economic Impact Study, 2015)

7.2   Features overview

IBM Connections is primarily a social platform for engaging the right people in the organization to collaborate. The collaboration is what helps people to act accordingly and respond to emerging opportunities. IBM Connections provides a) Social networking (IBM, 2015)

FEATURES OVERVIEW - IBM CONNECTIONS 5	
ACTIVITIES Activities	Where collaboration tools for collecting, organizing, sharing and reusing work related documents and items to a project or task are located.
	Best suited for targeted task such as planning events or tracking deliverables or product release.
	Activities are closed when the project or task is completed and archive it in an inactive state.
	For larger projects that involve collaborating on documents, WIKI is more appropriated.
BLOGS Blogs	Where people can create online journals and receive feedback.
	Used for a single author or few authors.
	For broader ideas exchange, FORUM is more appropriated.
	Communities can include multiple Ideation Blogs.
	Use @mentions in blog posts and replies to draw others into the conversation.
	Threaded comments make it easier to follow a conversation.
	Used for own comments can be edited and deleted.
	How the blog is displayed and how users interact with it depends on whether it is public or restricted.
	Restricted blogs are created from the Communities applications, which means the Communities applications must be deployed for IBM Connections.
BOOKMARKS Bookmarks	Where social bookmarking tools can be found for saving, organizing, and sharing internet and intranet bookmarks. It allows users to create shortcuts to web pages of interest to oneself and others.
	Bookmarks tools also help people to discover bookmarks created by others with similar interest and expertise.
	Share bookmarks with a specific group of people.
	Add bookmarks to a community with a defined membership.
	Keep bookmarks private or share them with everyone.
COMMUNITIES	The community can be used to a group collaboration where can be provided collaborative applications such as

Communities	Activities, Wikis, or Forums, to enable the community members to work together and share content.
	Used a community to share a collection of information with a group of members. It also can be public.
FILES **Files**	The common repositories where documents can be uploaded and shared with others.
	Upload files instead of attaching them to e-mails.
	A link to the file can be created without storing multiple copies of the file.
	Users with the file access can revise it, and any changes are immediately available to other users.
	Files have version control capabilities in addition to show who has viewed, downloaded and commented on any file.
	Files have also the ability to see files that have been recommended by others.
	If the intention is to define a group of people to have access to some files, the Files application can be used within the community.
FORUMS **Forums**	Is used for brainstorming and collect feedback on topics that are relevant for the users and their colleagues.
	Used to open discussions where users can create topics and responses about subjects of common interests.
	In Forums, statements and comments are collected in an exchange of ideas format, and it is presented as an ongoing conversation.
HOME PAGE **Home page**	Central location that provides a snapshot of all the latest updates from IBM Connections where people can work with entries in their activity stream, check the last updates to relevant content and people that have been followed.
	The display can be filtered to include only information that is the most relevant.
	Like updates, re-post updates, and comment on them all from the home page.
	Depending on the deployment chosen, updates from third-party applications can also be included.
WIKIS **Wikis**	Ideal for storing a large number of documents where members can view, co-author, capture and share information, depending on their privileges.
	Wikis created within a community is available only to members of that community.
	Support multi-languages
PROFILES	My Profile describes who the owner is and what he/she does.
ACCESSIBILITY	
MAIL	OPTIONAL – IBM Domino Server / Microsoft Exchange
POOLS and SURVEYS	OPTIONAL – IBM Forms
SOCIAL ANALYTICS	OPTIONAL – IBM Cognos Business Intelligence
CONTENT MANAGER	OPTIONAL - FileNet
PRESENCE, CHAT & MEETINGS	OPTIONAL – IBM Sametime

Table 9: IBM Connections features (IBM, 2015)

IBM Connections Suite V. 4.5 guide say:

> *"IBM Connections Content Manager is designed to enable organizations*

to combine the social collaboration features of the IBM Connections Suite with embedded content management capabilities to connect people to people, and people to information, content and knowledge." (IBM, 2015)

The traditional content library capabilities offered by IBM Connections Suite V. 4.5 (IBM, 2015)

1. Libraries - provides a way to add files and work with drafts, reviewers, and publishing in Communities while managing files from remote document repositories. Libraries require the Communities application.
2. Profiles - is the directory of the people within the organization.
3. Metrics - is where the statistics tools are located to display information about how people use Connections applications. Community metrics show details in a particular community and goal metrics show information across all Connections.
4. Accessibility – provides accessibility features to help users who have disabilities such as restricted mobility or limited vision sight.

IBM Connections Suite includes: (IBM, 2015)

1. IBM Connections 5 IFR1
2. IBM Connections Content Manager 5 (the pure ECM from IBM)
3. IBM Sametime© Complete 9.0

IBM Connections Content Manager 5 adds content management capabilities to communities in Connections. (IBM, 2015)

As IBM points out together, Connections Content Manager and Connections combine an enterprise-grade social software platform with embedded content management capabilities designed to make corporate content available for users across the organization. The Sametime© application brings the real-time communication to the entire platform. (IBM, 2015)

7.3   IBM Connections 5 New Features

IBM defines ECM software that is capable of building, organizing, managing and storing collections of digital works in any medium or format, which includes: (Center, n/a)

- Document management,
- Web content management,
- Capture and image management,
- Digital asset management, and
- Records management.

IBM Connections ECM core are: (Center, n/a)

1. Control content creation and access
2. Discover expertise and content
3. Act on content

Here is the list of the IBM enterprise content management capabilities: (Center, n/a)

1. Document Imaging & capture
    a. Capture content
    b. Automate document imaging
    c. Leverage integrated, flexible content repositories for content solutions
2. Advanced case management: (Center, n/a)
    a. Activate content
    b. Achieve collaboration, content, process, analytics and business rules
3. Social content management: (Center, n/a)
    a. Social content
    b. Share
    c. Collaborate
    d. Manage content in context
    e. Including Microsoft Office documents
4. Content analytics: (Center, n/a)
    a. Analyze content

b. Deliver new business insights rapidly by accessing, interpreting and analyzing unstructured content.

5. Information lifecycle governance: (Center, n/a)

   a. Govern content

   b. Reduce storage costs and risks

   c. Operationalize

   d. Automate, and

   e. Disposal programs

7.4   iWidget, Mobile, and Next

IBM Connections maintain solutions and documentation for its integration with other products such as: (Benitez, 2014)

- IBM Connections Desktop Plug-in for Microsoft products.

- Is used to integrate collaboration tools by posting mail messages to activities or get the benefit of Profiles application in the Outlook client. This plug-in brings the powerful capabilities of the IBM applications Activities, Blogs, and Profiles into Microsoft Office applications. Microsoft Outlook Social Connector can be used to interact with Connections network.

- IBM Connections Plug-in for Microsoft SharePoint.

- Is used to integrate IBM Connections collaboration service with Microsoft SharePoint.

- IBM Connections Widget for Microsoft SharePoint

- IBM Connections Widget can be used to access SharePoint documents from a community.

7.5   IBM Connections Plugin

"IBM Connections Plug-in for Microsoft SharePoint brings IBM Connections applications such as searching by tag, searching by profile,

and viewing business cards, into the SharePoint environment." IBM Connections Wiki. (IBM, IBM Knowledge Center, n/a)

As IBM itself described in the quote above, IBM Connections' plugin for Microsoft SharePoint brings IBM Connections content into SharePoint sites. The plugin features three different areas that are integrated through SharePoint web parts. In Microsoft SharePoint, Web parts are application parts, meaning pieces of functionality that are built-in, or custom made and even incorporated from other vendors into a particular space into the SharePoint site. (IBM, IBM Knowledge Center, n/a)
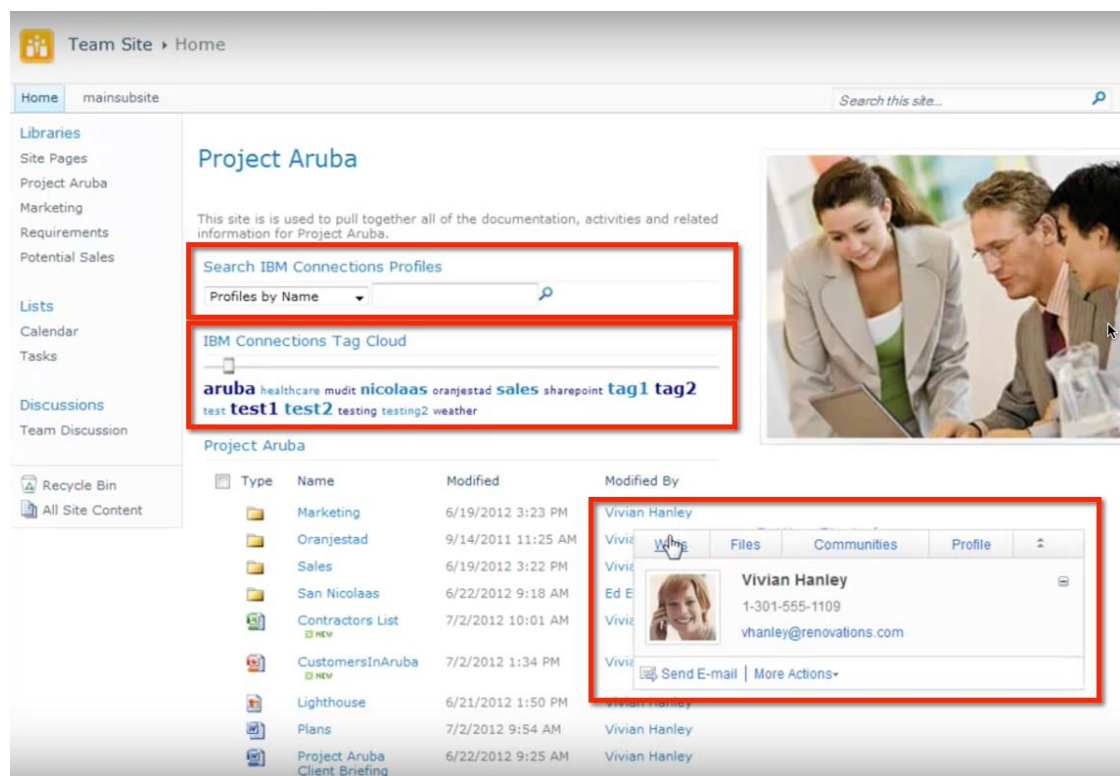
Figure 14: Screenshot from a video in youtube video demo for IBM Connections SharePoint plugin. (IBMConnectionsLV, 2012)

In the Figure 10 above show IBM Connections' plugin functionalities added to a SharePoint site: (IBM, IBM Knowledge Center, n/a)

1. In SharePoint Search, IBM Connections Profile is a web part, which allows users type in a username or keyword to search the IBM Connections profile application. The matched results are then displayed as a list on the search results page. If the search is performed by the SharePoint site owner, the search results also present the opportunity to add the search result profiles to

the site.

2. In the Tag cloud web part, IBM Connections' plugin presents the user with a view with the most popular tags across the entire Connection's server. The number of Tags can be expanded to review more or less number of tags by moving the slider to the right or the left. Once users click on one tag, IBM Connections search is open querying automatically the selected tag and displaying the results in IBM Connections application.

3. IBM Connections Business Card is integrated into SharePoint without calling the attention. In a SharePoint site, wherever there is a user's name, by hovering over it, the Business Card pop-up appears. In the top of the pop-up business card, there is a top navigation menu with links to the various IBM Connections applications. If any of the top navigation is clicked IBM Connections application opens showing the application content scoped to that particular user.

IBM Connections' plugin for SharePoint is only meaningful for organizations that have both IBM Connections and Microsoft SharePoint installed and want to integrate the social capabilities of Connections into the Document Management features of SharePoint. If the organization uses Microsoft Active Directory(AD) as their profile administration integration into SharePoint and do not possess IBM Connections application, IBM Connections' plugin would not be useful for that organization. (IBM, IBM Knowledge Center, n/a)

7.6   Summary

People, activities, file, chat and communities, wikis, forums, and bookmarks. Finally additional applications in communities. The IT department set up the Connections account

8   Research Reviews

In this chapter the author review Gartner and Forrester researchers who evaluate Microsoft and IBM document and social capabilities. In these researches, many

vendors are evaluated. However, only Microsoft SharePoint and IBM solutions, including Connections, are the ones relevant to this paper. The most difficult part of Gartner research was to determine which IBM application or suite of applications the researchers were evaluating. (Sondergaard, 2015)

8.1   Insider Gartner Research

Gartner, Inc. has an online paper which they explain their methodologies. In this section as the author uses Gartner quantitative and qualitative research, it is relevant to explain in what grounds Gartner research is done, which of their research process was chosen, what the processes chose consists of and finally the methodologies that are relevant for the research considered in this paper. (Sondergaard, 2015)

Gartner research grounds can be described below: (Sondergaard, 2015)

- Gartner research is an independent researcher institution that has an unbiased approach.
- The collection of facts in quantitative research blend well with the findings, observations, and analysis that belong to the qualitative approach.
- Peer review and collaboration - The qualitative approach is submitted to a number of "objective eyes" to test and re-test the conclusions before it is published.
- Rigorous and proven methodologies – Gartner reveals their methodologies are continually updated and improved as the most quality assurance value that Gartner role as an independent researcher is "never compromised."
- Finely tuned and role-based insight – Gartner takes proud on helping customers succeed in their role by delivering business outcomes to fulfill their customer needs from a variety of IT disciplines including the ones that are relevant for this paper.

Gartner research process includes: (Sondergaard, 2015)

- Refining scenarios taking into consideration what IT place will be in five to 10 years and consider the impact of customer current and future processes and investments.

- Conducting comprehensive surveys gathering formal and informal surveys of IT users, technology providers and investors, business professionals, researches from academia among other relevant researchers.

- Analyzing the emergence of patterns - The analysis from a variety of sources led to valid patterns that emerge within markets that help modify assumptions and sparkle new revelations.

- Creating the stalking horse is the step where after the data has been analyzed, Gartner analysts ask: "What position should Gartner take?". Gartner states:

  > "A 'Stalking horse' is a position released into the analyst environment to examined from divergent viewpoints, adjusted, tested and adjusted again, until it appears to be the strongest conclusion to offer clients. In creating a stalking horse, we initiate challenges, questions, more debate and achieve greater understanding." (Sondergaard, 2015)

- Validation is the final step which validates Gartner finds against multiple internal and external sources. In a debate if the consensus is reached is published if the consensus is not reached the position is discarded.

In the figure below can be seen the picture of Garner's process.

Figure 15: Gartner "Stalking horse" process. (Sondergaard, 2015)

Finally, is Gartner research methodologies such as a) Magic Quadrant, Critical Capabilities, Hype Cycle, IT Market Clock, Market Guide, Vendor Rating, ITScore, Market Share and Market Forecast. Gartner Magic Quadrant as it is the only one used in this paper and it is for this reason the only methodology here explained.

8.1.1 Gartner Magic Quadrant Methodology

Gartner explains Magic Quadrant methodology as a simple way to understand and evaluate the major IT markets, as it evaluates businesses from the middle phase of their life cycle examining their vision and ability to fulfill their customer's needs. The research goes through how well vendors execute against their vision by placing the companies/products and/or services four quadrants.

Figure 16: Gartner Magic Quadrant model (Sondergaard, 2015)
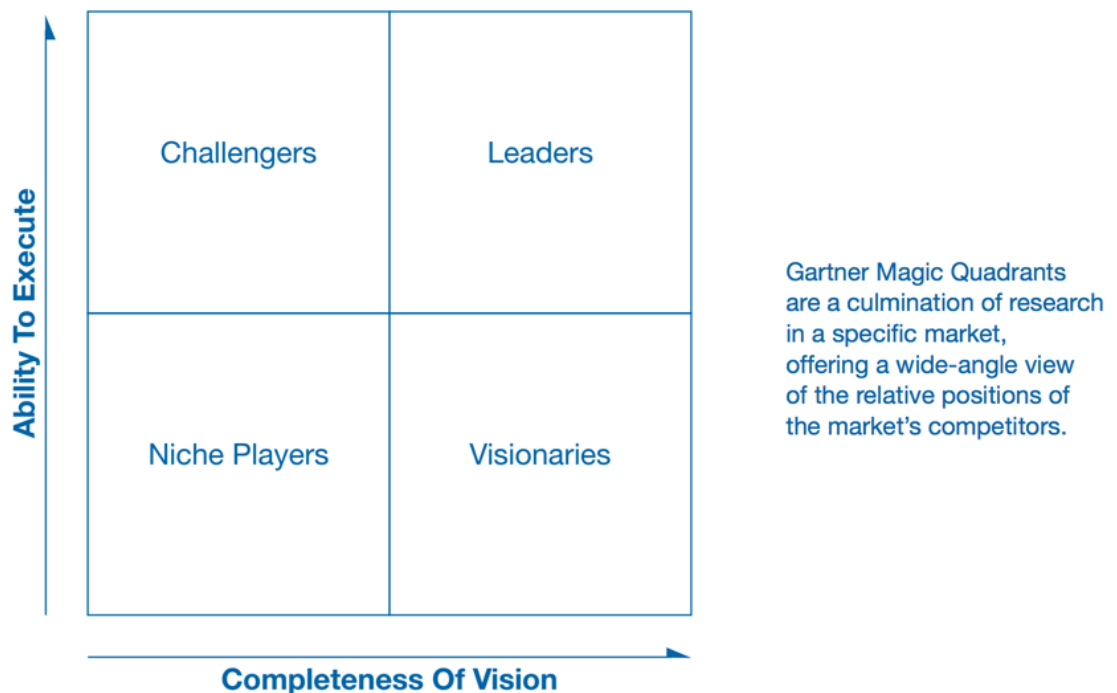
The Magic Quadrant is composed by challenger, niche player, leader, and visionary.

- Challengers: Vendors positioned in the Challengers' quadrant are well positioned. However, they may not have a strong strategy or value propositions up-to-date that attract new customers. Even larger vendors might see themselves in the challengers' quadrant if they decide to minimize

their risks instead of investing on innovating and keep relevant to their customers. If challenger vendors expand their vision, they might have the opportunity to move into leaders' position. (Karen A. Hobert, 2016)

- Niche Players: Vendors are positioned in the niche players' quadrant due to three factors: a) They do well in their niche market segment, b) They have innovation limitations, and C) Their competitors outperform their ability to bring value to the customer. Vendor positioned in the niche player's quadrant might be new entrants to the market that focus on functionality, or concentrate on the geographic region. (Karen A. Hobert, 2016)

- Leaders: Vendors placed in the leaders' quadrant provide a mature value proposition to their customers and meet today's market demand. Leaders have the vision to sustain their leadership position and focus on what they must do to impact and influence the market's overall direction. (Karen A. Hobert, 2016)

- Visionaries: Vendors positioned in the visionaries' quadrant are aligned with Gartner's view of how the market will evolve. It is the normal status of companies in new markets. However, enterprises in this quadrant have fewer possibilities or capabilities to deliver the value they want against their vision. They are within the high-risk category as they often build upon technology, which sells innovation first instead of mainstream demand, making them in need of financial, service, sales and/or distribution channels support. (Karen A. Hobert, 2016)

The analysis behind Gartner Magic Quadrant is the evaluation criteria that assesses how well the technology companies, their products, and services provide value to customers compared with their vision.

In the horizontal axis includes a) Market understanding, which is the company's ability to understand what organizations' decision-makers needs are regarding to products and services, b) Marketing strategy analyzes how consistent and clear is the communication through the web, advertising, customer programs and vendors' positioning statements to their clients, c) Sales strategy analyzes the complete seller's market reach through sales and marketing sales support communication and

customer based, d) Product and service strategy analyzes from the current and future business requirements perspective the ability vendors have to differentiate their features and processes to their product development and delivery, e) Business model analyzes the logic of vendor's business proposition against how valid it is to their customer, f) Vertical industry strategy analyzes *"strategy for directing resources to meet the needs of market segments, including those of vertical industries"*, g) Innovation analyzes vendor's resources, investment and consolidation capabilities, h) Geographic strategy analyzes how capable the vendor is to act by themselves or through partners, channels, and subsidiaries within and outside their native home area. (Karen A. Hobert, 2016)

In the vertical axis includes a) Product and service management analyzes *"product and service capabilities and product management, quality, feature sets and skills, these capabilities can be offered natively or through original equipment manufacturers(OEMs)";* b) Overall viability analyzes the *"overall financial health, the financial and practical success of the relevant business unit and the likelihood the business will continue to invest in this product offerings"*; c) Sales execution/pricing analyzes *"pre-sales capabilities and support structure, including management, pricing and negotiation, pre-sales support and the overall effectiveness of the sales channel."*; d) Market responsiveness and track record analyzes *"the ability to respond, change direction and act with flexibility to achieve success as market gaps develop, competition increases, customer needs evolve and market dynamics change";* e) Marketing execution analyzes *"the quality and efficacy of programs designed to deliver the provider's message to influence the market, promote its brand, increase product awareness and create buyer empathy"*; f) Customer Experience analyzes *"relationships, products and programs that enable clients to experience success through the provider's offerings"*; and g) Operations analyzes the *"ability to meet goals and commitments"*. (Karen A. Hobert, 2016)

Organization's decision-makers use Magic Quadrant when they have the need to invest in an accurate information Technology system and want to understand the provider's or vendor's offerings beforehand and how well their solutions will meet their needs for current and future needs. (Karen A. Hobert, 2016)

Gartner has researched twenty ECM vendors, their business commitment and their ability to deliver relevant business applications to customers. Only IBM and Microsoft ECM systems are the ones presented in this paper. Gartner strategic planning assumptions are:

> "By 201, more than 20% of enterprise content management solution sales will address multiorganization 'ecosystem' content.", and "By 2018, 50% of enterprises will be managing their content using a hybrid content architecture." (Karen A. Hobert, 2016)

Gartner Market Definition/Description is quoted:

> "As a technical architecture, ECM can be delivery either as a suite of products integrated at the content or interface level or as a number of separate products that share a common architecture." (Karen A. Hobert, 2016)

Consolidation in the market is a concert for Gartner because large ECM vendors when do not possess the ability to keep up with new enterprise file synchronization and sharing(EFSS), video content management and asset management, they build the expertise necessary by acquiring new companies or through partnerships. It is a problem because it means vendors do not possess the technical expertise themselves on their ECM functionalities and instead of investing in their long term solution, they fill the gaps by other means.

The advantage of consolidation is that customers purchase one suite from one vendor and get more value for their money. Also, the portfolio with less complexity is easier to manage. The advantage is the concerning regarding the future directions that vendor.

The ECM market is complex, and when customers plan to acquire one, usually there are years of planning the strategy. Gartner in 2016 emphasizes the core functionalities of ECM systems should be to fulfill the following lists. Vendors that are not able to natively supply these core functionalities will not be considered in the

Magic Quadrant.

- Document Management: (20%, unchanged from 2015) the system is for check-in/check-out, version control, security and library for business documents.

- Record Management: (10%, unchanged from 2015) the system for long-term archiving, automation of retention and compliance policies and ensuring industry compliance with legal and regulatory documents.

- Image-Processing Applications: (10%, down from 15% in 2015) the system for capturing, transforming and managing images of paper documents.

- Social Content/collaboration: (15%, unchanged from 2015) the system for document sharing and collaboration support for project teams and knowledge management.

- Content Workflow: (15%, down from 20% in 2015) of the system for supporting business processes, routing content, assigning work tasks and states, and creating audit trails.

- Packaged apps and integration (5%, new for 2016) extends content management capabilities, services, and support to another business process.

- Analytics/BI (5%, new for 2016) analyzes file content and content information, resources and repositories.

- Extended Components: (20%, up from 15% in 2015) of the system that may include one or more of a) mobile applications, b) digital asset management, c) search, d) analytics and e) package integration capabilities. The minimum required is at least one or more. (Karen A. Hobert, 2016)

Gartner affirms in the 2016 Magic Quadrant the business requirements for digital content are demanding changes to ECM market. The follow the list of strategic planning assumptions Gartner research make for the analysis:

- Organizations will have them by 50% their content management through a hybrid content system in 2018.

- Organizations sales will be about multiorganization ecosystem content by more than 20% by 2018.

- Standard in the industry will be synchronization and sharing and collaboration by 2018.

- Cloud-base offerings will be at least 50% of leading ECM vendors by 2018.

- Business content will be done by machines by at least 20% by 2018.

- Analytics will be part of ECM at 70% due to noncontextual business content by 2018.

8.1.2   Gartner Magic Quadrant figures for 2015 and 2016

Gartner's Magic Quadrant for Enterprise Content Management for 2015 and 2016 are shown below. However, they are explained in their respective vendors' section. (Karen A. Hobert, 2016)

Figure 17: Gartner ECM Magic Quadrant 2015 (Koehler-Kruener;Chrin;& Hobert, 2015) (Karen

A. Hobert, 2016)

Magic Quadrant
Figure 1. Magic Quadrant for Enterprise Content Management

Figure 18: Gartner ECM Magic Quadrant 2016 (Karen A. Hobert, 2016)

Now that Gartner's methodology and assumptions are clear, and the figure of Magic Quadrant from 2015 and 2016 have been exposed, in the following sections, we evaluate Microsoft SharePoint and IBM ECM rank on Gartner's research. (Koehler-Kruener;Chrin;& Hobert, 2015)

8.2   Gartner's IBM Evaluation

Gartner's Magic Quadrant ranks IBM as top leader in the market in both 2015 and

2016. However, it starts to be challenged by Hyland's ECM that is in second place in 2016. The rank takes into account IBM's ECM software revenue, mostly because of IBM's broad higher-value, its tools and for its extensive support to social, mobile, content management and analytics that strongly support large, multinational enterprises in both social content and content management. IBM's long time in business also plays a role.

The below table shows IBM's strength and weaknesses.

IBM Connections' Suite STRENGHT	IBM Connections' Suite CAUTIONS
The completeness of IBM's ECM product line makes it the leading benchmark for ECM capabilities.	IBM's extensive product line includes some overlapping capabilities, which creates confusion for prospective customers to evaluate what are the solutions they provide. The cost should include the full cost of implementation during sales negotiations. (2015 & 2016)
Integration across product lines include social and collaboration, analytics, port and Web Content Management (WCM). It also includes Business Process Management (BPM) solutions, which is one of IBM strong and most attractive ECM option for a large organization with complex needs. (2015)	Prospective customers should evaluate IBM's products and focus on areas where they might be able to leverage integration with existing systems. (2015)
IBM has a significant global presence and installed base through direct and reseller partnerships and can serve clients almost anywhere. (2015)	IBM's extensive product line adds choice, purchasing, implementation and support challenges for some customers. (2015)
IBM's Content Navigator UI (User Interface) is a universal access layer that can be added to both on-premises and cloud-hosted content, including non-IBM content repositories to allow for a universal view across information. (2015)	Watson poses solutions that are confusing to buyers to understand which options ECM support. Customers should inquire for Watson integrations problems with their ECM tools before purchasing. (2016)
Watson is in content analytics for digital business, which is a visionary product for unstructured content. (2016)	
IBM partnered with BOX (EFSS-Enterprise File Synchronization and Sharing company), which leverage the integration it is traditional offering to the level of innovation with new user	

experiences brought by Box's cloud-based EFSS. (2016)	

Table 10: Table created by the author from Gartner's ECM Magic Quadrant 2015 & 2016 (Koehler-Kruener;Chrin;& Hobert, 2015) (Karen A. Hobert, 2016)

8.3   Gartner's Microsoft Evaluation

Microsoft has been losing position since 2014 In 2015 Microsoft and is now in 2016 in fourth place. Microsoft in 2015 still belongs to the leader's place. However this year Microsoft has dropped to the leader of Challengers quadrant. In Gartner's 2014 ECM research Microsoft was in the leaders' quadrant in the second place. In Gartner's 2015 ECM research Gartner research affirms two-thirds of Microsoft clients around the globe use SharePoint due to its strong integration with Microsoft Office2013/Office2016, Exchange, and Windows. Its main focus has been on cloud deployments through SharePoint Online in Office 365. In 2016 due to the constant evolution of Office 365 SharePoint On-premises and Cloud-based products different in functionality. (Karen A. Hobert, 2016)

The table below shows Microsoft's strengths and weaknesses in Gartner's research.

MICROSOFT SHAREPOINT STRENGHT	MICROSOFT SHAREPOINT CAUTIONS
Office 365's cloud capabilities turn SharePoint as a very attractive ECM solution. The main benefits are easy to implement and just stat using it. The Microsoft is current the leader in the market for ECM as a SaaS delivery.(2015)	SharePoint Online's functionalities and capabilities do not match SharePoint on-premises. Before a final decision, customers should consider experimenting with SharePoint Online or Office 365. It would help organizations to ensure their business needs will be satisfied from both SharePoint cloud OOB and even with additional third party add if required. (2015 and 2016)
Microsoft SharePoint, strong collaboration tools for teams, has been one of its strong basis. (2015)	SharePoint need for add-ons third-party tools to expand SharePoint's capabilities is still an issue, but the new SharePoint 2016 released in May 2016 may reduce the need for add-ons. (2016)
The new Office365 capabilities such as Delve	The value proposition for upgrading from

with the personalized, contextual search for a document, conversation and people, OneDrive for Business, Cortana that is the visual assistant and the new mobile SharePoint app are strong points for the cloud-based ECM solutions. (2016)	SharePoint on-premises 2013 to 2016 is not compelling. Microsoft needs regular feature packs and updates to mitigate functional gaps for customers that are not moving to Office 365. (2016)
	Hybrid deployment of SharePoint is not the turnkey solution for organizations that may face infrastructure complexities, even though it has been a booming business. Skills availability issues and cost in closing the gap from SharePoint Server (on-premises) and online are needed. Some issues have been addressed with new tools, but more resources and support are still needed for customized sites. (2016)

Table 11: Table created by the author from Gartner's ECM Magic Quadrant 2015 and 2016 (Koehler-Kruener;Chrin;& Hobert, 2015) (Karen A. Hobert, 2016)

8.4 Gartner Magic Quadrant for Social Software in the Workplace

In this research Gartner goes through the market for social software primarily used for support people working together in a team, communities or networks. Gartner emphasizes the products reviewed don't constitute any particular business process or activity, but rather, they are used to support various collaborative activities that are used mainly for enterprises, by their employees, also external customers, suppliers, and partners. At the end of this chapter, there is a section dedicated to explaining Gartner's research criteria. (Gotta;Drakos;& Mann, 2015)

There are two Gartner's Magic Quadrant shown below. The first is for the research done in 2015. Microsoft is still the leader of both years. However, IBM is catching up. (Gotta;Drakos;& Mann, 2015)

Magic Quadrant

Figure 1. Magic Quadrant for Social Software in the Workplace

Figure 19: Source Gartner Magic Quadrant for Social Software in the Workplace (Gotta;Drakos;& Mann, 2015)

In the following sections can be found the IBM Connections and Microsoft evaluation SharePoint of the year 2015.

8.5   IBM Social Evaluation

In 2015, IBM Connections raised to be one of the first products to target and focuses on the social software market. IBM Connections Suite includes Sametime instant chat, IBM Notes, IBM Domino, FileNet Content Manager and WebSphere Portal Server. (Msahmadi, 2015)

IBM STRENGTHS	IBM CAUTIONS
VIABILITY "IBM has a long history as a dominant provider of collaboration, messaging and communications solutions, and remains one of the better-established company's in the ESN space. It has extensive research and development capabilities and also cultivates strategic relationships at very senior levels, both in user organizations and with partners." **(Gotta;Drakos;& Mann, 2015)**	**COMPLEXIBILITY** "IBM's breadth of capabilities, the number of products, and deployment options can introduce complexity regarding decision criteria, costs, configuration and support needs for on-premises deployments (versus cloud-based)." (Gotta;Drakos;& Mann, 2015)
STRATEGY "IBM's strategy spans beyond typical ESN positioning to broadly catalyze the value of Connections within its Social Business and Smarter Workforce initiatives. It also emphasizes the role of other assets it brings to its solutions, such as IBM Design Thinking, IBM Bluemix, IBM Watson, IBM Kenexa and its large partner ecosystem." **(Gotta;Drakos;& Mann, 2015)**	**INTEGRATION** "IBM positions Connections as a place where people get work done. For example, work activities from business systems (such as sales, marketing, customer service, and HR applications) can be brought into Connections via OpenSocial interfaces. However, integration of surface social elements from Connections into those business applications is not as strong "out of the box" as it needs to be. While developers can use the Connections' APIs to deliver that type of user experience (or rely on third-party ISVs), IBM needs its prebuilt integrations for users that prefer to have social interaction natively embedded in the applications they use during the flow of collaborative work rather than switch to a social platform." (Gotta;Drakos;& Mann, 2015)
FUNCTIONALITY "IBM Connections includes a variety of capabilities such as content management and enterprise file synchronization and sharing (EFSS) that make it a comprehensive solution for organizations looking to deliver an all-in-one destination for employees to share information and collaborate around work activities. Its ability to integrate with WebSphere Portal Server enables	**FOCUS** "IBM is heavily marketing Verse as its next-generation business email solution. While Verse has many synergies with Connections, there is also some risk that customers will view the marketing messages as a shift away from its ESN efforts." (Gotta;Drakos;& Mann, 2015)

organizations to extend their enterprise portal (if that is the preferred employee destination site) with social experiences." **(Gotta;Drakos;& Mann, 2015)**	

Table 12: Table created by the author of this paper based on Gartner Magic Quadrant for Social Software in the Workplace (Gotta;Drakos;& Mann, 2015)

8.6   Microsoft Social Evaluation

Microsoft is in the Leaders' quadrant 2013 and 2015. The products for this market are SharePoint and Yammer that overlap on collaboration and social capabilities. Although SharePoint is a broad product that includes document management, portal, application development, BI and Web content management, both tend to become part of a single solution in the future. (Gotta;Drakos;& Mann, 2015)

"Microsoft is in the Leaders quadrant. Microsoft has focused its social efforts on its online offerings Yammer and Office 365 (through the closer incorporation of Yammer with the rest of Office 365) while focusing SharePoint on related capabilities — including document management, portals, and websites." (Gotta;Drakos;& Mann, 2015)

STRENGTHS	CAUTIONS
PRODUCT	ARCHITECTURE
"Microsoft has targeted a broad audience with a broad product platform incorporating social capabilities. While not every component is best in class, they are good enough in sufficient areas that most enterprise users can find the functionality they need, with some parts (such as Yammer) providing compelling functionality."	"Microsoft's move toward the cloud, in the form of Office 365, and its de-emphasizing of SharePoint as a social software platform have triggered significant changes for many existing customers. Some mismatches between Yammer and other Microsoft products have caused confusion: for example, Microsoft implemented the "group" concept differently in Office 365 and Yammer (slated to be fixed in 1H16)."
ROADMAP	COMPLEXIBILITY

"Microsoft has increased its pace of innovation with a slew of new products and capabilities released under the Office 365 banner, plus interesting developments described for capabilities such as the Office Graph, and incorporation of smart machine virtual assistant technology from Cortana."	"As Microsoft introduces new products and ways to access Office 365 capabilities, the overall product offering becomes harder to navigate and understand. For example, the SharePoint newsfeed functionality overlaps with the Yammer activity stream, Yammer Now offers largely the same functionality as the IM component of Skype for Business, Delve offers a different and more social way of searching, but users can also search content using SharePoint."
ADOPTION "The level of interest and firm plans for organizations to move to Office 365 and related Microsoft products are growing quickly. Microsoft can measure its social and collaboration business in billions of dollars. It would take highly disruptive events or severe missteps for Microsoft to lose its leadership position in this market."	FOCUS "As Microsoft's collaboration, communications, and social offerings continue to expand, it will be difficult for even this sizable organization to sustain the required level of attention across all of its new products — as well as the ones that IT organizations have come to depend on — while maintaining quality, compatibility and a clear vision. IT managers are already finding it difficult to navigate Microsoft's offerings. Microsoft is managing many moving parts as it expands with new titles (such as Clutter, Lens, Sway, Send, Cortana and Delve), and coordinating its focus will be a challenge."

Table 13: Table created by the author of this paper based on Gartner Magic Quadrant for Social Software in the Workplace (Gotta;Drakos;& Mann, 2015)

8.7   The Magic Quadrant Criteria

Gartner' requirement for the qualitative research is that the vendor should focus on support teams, communities, and networks as the primarily objective. As quantitative criteria, the vendor must have at least 100 employees, have generated at least 18 million dollars in revenue, have a presence in at least three geographic regions, among other things. (Sondergaard, 2015)

Gartner's Magic Quadrant criteria focus on two main areas: the ability to execute and the completeness of vision evaluation criteria.

Table 1. Ability to Execute Evaluation Criteria

Evaluation Criteria	Weighting
Product or Service	High
Overall Viability	High
Sales Execution/Pricing	Medium
Market Responsiveness/Record	Not Rated
Marketing Execution	Medium
Customer Experience	High
Operations	High

Source: Gartner (October 2015)

Table 14: The Ability to Execute Evaluation Criteria. (Gotta;Drakos;& Mann, 2015)

The table above depicts the Gartner's evaluation criteria and the weight it has in their vendor's evaluation. Product and Service had a high weight and analyzed the product or service functionality rating. Overall viability has high weight and refers to both the financial health of the vendor as a business as well as how committed their business is on investing. Sales execution and pricing has a medium weight, and it refers to the ability to sell to large organizations, the price transparency, the number of employees the organization has and how large and well organized is its distribution channel. Market responsiveness and record do not have a rate, which means that it does not have measurable factors to stand out on the vendor's evaluation. Marketing execution has a medium weight, and it refers to brand recognition and the seller's marketing initiatives. Customer Experience has a high weight, and it relates to the client's feedback from the companies evaluated. Operations have a high weight, and it relates to the quality of the vendor's organization structure. (Gotta;Drakos;& Mann, 2015)

Table 2. Completeness of Vision Evaluation Criteria

Evaluation Criteria	Weighting
Market Understanding	High
Marketing Strategy	Medium
Sales Strategy	Medium
Offering (Product) Strategy	Medium
Business Model	Not Rated
Vertical/Industry Strategy	Not Rated
Innovation	High
Geographic Strategy	Medium

Source: Gartner (October 2015)

Table 15: Completeness of Vision Evaluation Criteria. (Gotta;Drakos;& Mann, 2015)

The table above depicts Gartner's Completeness of Vision Evaluation Criteria and the weight it has in the evaluation criteria. Market understanding has a high weight and is where each vendor demonstrates their understanding of collaboration and social software opportunities. Marketing strategy has a medium weight, and it refers the degree to which each vendor's marketing approach knows how to fit and exploit emerging trends and the market's overall direction. Sales strategy has a medium weight, and it refers to the ability the vendor has to engage with both business and IT decision makers. Offering (product) strategy has a medium weight and refers to the degree to which each vendor's product roadmap reflects demand trends and opportunities to create demand. Business model and vertical industry strategy are not rated because they do not possess sufficient measurable factors to make and impact on the evaluation. Innovation has a high weight, and it refers to the degree to which each vendor invests in R&D (research and development) to continue to develop their software in a creative manner. The geographic strategy has a medium weight, and it refers to the how well vendors focus their energy to reach multiple geographic markets. (Gotta;Drakos;& Mann, 2015)

8.8 Gartner Research Review Summary

In Gartner's evaluation of ECM systems IBM takes the leader absolute position while Microsoft is in third place, being the leader for the ECM SaaS market.

IBM was evaluated for the Connections Suite in Gartner's research. WebSphere Portal server is also part IBM ECM due to its portal framework for development and integration with Lotus Notes Domino work environment. Microsoft SharePoint was also evaluated for Office 365 and all the software as a service (SaaS) that includes with different types of enterprise subscriptions. These different subscriptions include more or less enterprise software that complement SharePoint, which turns Microsoft into an attractive ECM solution for companies of all sizes. Their large ecosystem and their customization capabilities make them SaaS leaders. (Forrester total Economic Impact Study, 2015)

8.9 Inside Forrester Research

Forrester Research, Inc. is an independent research company that provides advice to global leaders in business and technology. Their research target senior management in business strategy, marketing, and information technology. Forrester proprietary research goal is to provide the consumer, business data, and custom consulting to organizations. In this section, the author goes through the Forrester research methodologies.

Forrester uses "The Forrester Wave" methodology to compare products and services of vendors to help decision-makers to select the appropriate product or service that better fit their needs.

Forrester explains their evaluation as such:

> *"The Forrester Wave uses a transparent methodology to compare the players in software, hardware, or services market so that the role professionals we serve can make well-informed decisions without spending months conducting their research. The Forrester Wave offers two big benefits to clients: our detailed analysis of vendor's products and*

> *services based on transparent criteria and an Excel spreadsheet that*
> *allows clients to easily compare products and develop custom shortlists*
> *according to their own requirements." (Forrester, n/a)*

A preparation checklist is part of the before analyst's work. The checklist is composed by Researches the category – "determine if the product or service is appropriate for a Forrester Wave." (Forrester, n/a) Identifies the category or defines the scope – "Analyst examines how companies buy to define the scope of a Forrester Wave." (Forrester, n/a) Selects an evaluation method – "There are two types of Forrester Wave evaluations: lab-based and questionnaire-based. Lab-based evaluations include demonstrations of products at a Forrester office." (Forrester, n/a) "…Questionnaire-based evaluations rely on vendors to fill out surveys with product information", that also includes a web-based product demo. Creates the research plan and timeline – Here "the analyst, content editor, and RA determines an appropriate project timeline and identify key milestones." (Forrester, n/a)

The Forrester Wave process is built upon four key players: Analyst: "The analyst is the content expert for the Forrester Wave. The analyst determines the inclusion criteria, the evaluation criteria, and the scoring framework based on our Forrester Wave methodology." (Forrester, n/a). Research associate: "Research Associate (RA) drives and maintains the Forrester Wave project schedule and communicates with vendors throughout the process in most instances." (Forrester, n/a). Vendor response team: "Provides detailed product and service information." (Forrester, n/a). Customer reference: "Share their experiences with the product – anonymously. Forrester will request a maximum of three customer references from Wave participants." (Forrester, n/a)

The Forrester Wave work as a process span by five milestones that have specific deliverables each: Milestone 1: Create Evaluate Criteria – this is the first phase in which the analyst works with the content editor, research associate, and external experts in order to: 1. Draft the product or service evaluation criteria, 2. Develop criteria explanations, 3. Get feedback from the content editor and, 4. Other Forrester experts and design scenarios (lab-based evaluations only). Milestone 2: Determine

Vendors for Inclusion – this is the second phase where the analyst, content editor, and research director end up with a group of vendors that will be evaluated by the Forrester Wave. The tasks in this phase include a) Select vendors based on inclusion criteria, b) Sends vendors invitations and c) Holds a vendor kick-off teleconference. Milestone 3: Gather Evaluation Data – third phase where Forrester analysts gather data to be examined from the list of the vendors selected in the previous phase. The tasks in this phase include: a) Distributes a questionnaire with the evaluation criteria, b) Conducts the lab evaluations (lab-based evaluation only), c) Holds the executive strategy calls and d) Checks the facts. Milestone 4: Create the Vendor Comparison – the fourth phase where Forrester Wave produces the following deliverables: a) Developing the Forrester Wave vendor comparison, b) Performing a final scorecard review and c) Writing the Forrester Wave report. Milestone 5: Publish the Forrester Wave Report – In the fifth and final phase is where the all the deliverables are reviewed before it is published. Forrester though sends out the courtesy preview document as a prior publishing task to give the vendors a chance to express their points and make corrections if necessary. (Forrester, n/a)

8.10   The Forrester Wave: Enterprise Social Platforms, Q2 2014

The market is evolving rapidly and from one year to another big change occur, such as merger and acquisitions, and innovations. The bottom line is, now that social platforms are more mature, vendors began to differentiate their social offerings. The three well-positioned companies within enterprise social networking are IBM, Microsoft, and Salesforce.com. In this article, Forrester Research evaluates 13 most significant solution providers for Enterprise Social platforms. (Koplowitz, The Forrester Wave: Enterprise Social Platforms, Q2 2014, 2014)

Forrester evaluation criteria covered vendor's current offerings, strategy and market presence. The current offerings were subdivided into: a) core functionality, b) language support, c) architecture and administration, d) event log, e) monitoring and reporting, f) security, g) cross-platform support, and h) engagement and workplace readiness. The strategy included the position vendors get from their feature

enhancements, the vendors' strategy and vision and the resources vendors have to support their strategy. Market presence is where the vendors are evaluated by their financial performance, installed base, integration partners, professional services, the number of employees, and technology partners.

Vendor	Product evaluated*
Atlassian	Confluence
blueKiwi	blueKiwi
IBM	Connections
Jive	Jive
Microsoft	Office 365 (including Yammer)
Microsoft	Yammer
Neudesic	Neudesic Pulse
OpenText	OpenText Tempo Social
salesforce.com	Chatter and Communities
SAP	Jam
Sitrion	Sitrion Social
VMware	Socialcast
Tibco	tibbr
Zimbra	Zimbra Community

*All products evaluated were generally available as of February 2014.

Figure 20: Source The Forrester Wave: Enterprise Social Platforms, Q2 2014 (Koplowitz, The Forrester Wave: Enterprise Social Platforms, Q2 2014, 2014)

Forrester vendor's selection criteria have the following offerings:

Participating vendors were required to have most of or all of the following:
Profiles, user home page, activity streams, community/group capabilities, tagging, discussion threads, blog, and wiki.
Vendors received frequent consideration in Enterprise Social Strategy or Collaboration Strategy.

Table 16: Source Vendors selection criteria at Forrester Wave. (Koplowitz, The Forrester Wave: Enterprise Social Platforms, Q2 2014, 2014)

Based on Table 21 above the Forrester Wave graphic for Enterprise Social Platforms Q2, 2014 is shown below.

Figure 21: Source The Forrester Wave: Enterprise Social Platforms, Q2 2014 (Koplowitz, The Forrester Wave: Enterprise Social Platforms, Q2 2014, 2014)

In the Leaders, group can be found IBM and Microsoft Office 365 + Yammer.

Forrester describes the leaders as:

> "Leaders all offer very mature and, more importantly, very complete offerings. In addition, each has differentiated in some critical area like integration with a broader portfolio or has provided an established partner marketplace. The end result in each case is a robust core product offering that extends the value through a broader ecosystem."

(Koplowitz, The Forrester Wave: Enterprise Social Platforms, Q2 2014, 2014)

In the Strong group is found Microsoft Yammer. Forrester describes the Strong Performers as:

> *"The Strong Performers each stand out in multiple areas of the evaluation, but are not as strong across the board as the Leaders. For some vendors, notably Neudesic Pulse and Microsoft Yammer, their standings in the Forrester Wave are more reflections of their heritage as activity stream vendors. If your main concern is activity stream functionality, use the Forrester Wave controls to adjust the weightings and identify the options that best serve that more narrow set of needs."*
>
> *p.5, (Koplowitz, The Forrester Wave: Enterprise Social Platforms, Q2 2014, 2014)*

The picture below is the Forrester Wave Excel-based vendor comparison where more detail product evaluation is drawn.

Figure 2 Forrester Wave™: Enterprise Social Platforms, Q2 '14 (Cont.)

	Forrester's Weighting	Atlassian	blueKiwi	IBM	Jive	Microsoft Office 365	Microsoft Yammer	Neudesic	OpenText	salesforce.com	SAP	Sitrion	Socialcast by VMware	Tibco	Zimbra
CURRENT OFFERING	50%	2.52	2.34	4.17	3.93	3.50	2.96	3.03	2.56	3.61	3.13	3.66	2.51	3.61	3.57
Core functionality	40%	2.44	2.63	4.04	3.98	3.54	2.37	2.95	2.30	2.80	3.24	3.93	1.99	3.57	3.63
Language localization	5%	3.68	1.34	3.34	2.68	5.00	5.00	1.00	1.34	4.33	3.35	2.01	1.34	2.01	4.34
Architecture and administration	10%	2.30	2.30	3.30	3.90	2.90	2.70	2.90	3.40	3.10	2.30	3.70	2.60	2.90	3.20
Event logs, monitoring, and reporting	5%	3.00	3.00	5.00	5.00	3.34	3.00	3.66	3.33	5.00	2.01	3.66	3.33	4.32	5.00
Security	10%	2.75	4.00	4.50	4.75	4.25	4.25	2.50	4.50	4.50	4.00	4.50	3.50	4.25	4.25
Cross-platform support	10%	1.00	1.50	5.00	3.00	3.50	3.50	2.50	2.00	5.00	3.00	3.00	3.00	3.50	1.50
Engagement workplace readiness	20%	3.00	1.45	4.30	3.95	3.00	2.85	4.15	2.10	3.80	3.20	3.40	2.85	4.00	3.80
STRATEGY	50%	3.80	3.40	4.40	4.40	4.80	3.40	3.40	3.20	4.80	3.00	3.00	2.60	3.40	4.00
Executive vision and strategy	100%	3.80	3.40	4.40	4.40	4.80	3.40	3.40	3.20	4.80	3.00	3.00	2.60	3.40	4.00
MARKET PRESENCE	0%	3.33	2.10	4.58	4.30	4.66	3.17	2.41	3.29	3.82	3.88	3.24	2.58	4.32	3.24
Installed base	34%	3.00	1.00	3.75	3.25	4.00	2.25	1.25	1.75	2.50	3.00	2.25	1.75	3.00	1.75
Employees	33%	2.00	4.00	5.00	5.00	5.00	4.00	4.00	4.50	4.00	5.00	3.50	4.00	5.00	3.00
Partners	33%	5.00	1.34	5.00	4.67	5.00	3.30	2.00	3.68	5.00	3.68	4.01	2.01	5.00	5.00

All scores are based on a scale of 0 (weak) to 5 (strong).

Source: Forrester Research, Inc.

Figure 22: Source Current Offerings from The Forrester Wave: Enterprise Social Platforms, Q2 2014, p.7 (Koplowitz, The Forrester Wave: Enterprise Social Platforms, Q2 2014, 2014)

Forrester Wave consolidates the SBC (Social Business and Collaboration) and activity stream. The Table shows how Forrester Research scored vendors on their SBC based offerings on a scale of 0 (weak) to 5 (strong). The Current Offerings' numbers show that IBM is graded at 4.17 compared to Microsoft 3.5 for Office365 and 2.96 for Yammer. Microsoft though scores more in Language Localization with a maximum score of 5.0 for both Office 365 and Yammer compared to 3.34 to IBM. Microsoft also gets a slightly better score for Market Presence in Installed Based. (Koplowitz, The Forrester Wave: Enterprise Social Platforms, Q2 2014, 2014)

Forrester research on page 8 breaks down the product evaluation, feature comparisons, and customization rankings in the graphic shown below for activity streams. It acknowledges that customers may not need all the Social Networking

features. (Koplowitz, The Forrester Wave: Enterprise Social Platforms, Q2 2014, 2014)

Figure 23: Source Activity Stream from The Forrester Wave: Enterprise Social Platforms, Q2 2014, p.8 (Koplowitz, The Forrester Wave: Enterprise Social Platforms, Q2 2014, 2014)

The following Figure 24 discusses the current offerings for the activity streams. Even though IBM is not included in this comparison, the author decided to mark Salesforce.com score just to show that it superposes Microsoft's in almost everything. Forrester Research scored vendors on their activity streams offerings based on a scale of 0 (weak) to 5 (strong). (Forrester, n/a)

Figure 3 Forrester Wave™: Enterprise Social Platforms, Q2 '14 — Activity Streams (Cont.)

	Forrester's Weighting	Microsoft Yammer	Neudesic	salesforce.com	SAP	Socialcast by VMware	Tibco
CURRENT OFFERING	50%	3.09	3.30	3.80	3.18	2.83	3.82
Core functionality	40%	2.69	3.61	3.29	3.36	2.80	4.10
Language localization	5%	5.00	1.00	4.33	3.35	1.34	2.01
Architecture and administration	10%	2.70	2.90	3.10	2.30	2.60	2.90
Event logs, monitoring, and reporting	5%	3.00	3.66	5.00	2.01	3.33	4.32
Security	10%	4.25	2.50	4.50	4.00	3.50	4.25
Cross-platform support	10%	3.50	2.50	5.00	3.00	3.00	3.50
Engagement workplace readiness	20%	2.85	4.15	3.80	3.20	2.85	4.00
STRATEGY	50%	3.40	3.40	4.80	3.00	2.60	3.40
Executive vision and strategy	100%	3.40	3.40	4.80	3.00	2.60	3.40
MARKET PRESENCE	0%	3.17	2.41	3.82	3.88	3.09	4.32
Installed base	34%	2.25	1.25	2.50	3.00	3.25	3.00
Employees	33%	4.00	4.00	4.00	5.00	4.00	5.00
Partners	33%	3.30	2.00	5.00	3.68	2.01	5.00

All scores are based on a scale of 0 (weak) to 5 (strong).

Source: Forrester Research, Inc.

Figure 24: Source Current Offerings for activity stream from The Forrester Wave: Enterprise Social Platforms, Q2 2014, p.9 (Koplowitz, The Forrester Wave: Enterprise Social Platforms, Q2 2014, 2014)

The author has marked in red the scores to show that Salesforce.com scores higher than Microsoft in almost everything except Language localization, the average is higher as well.

8.11   IBM Forrester Social Evaluation

Forrester evaluates IBM connections as expanding its scope across its broad portfolio to create value for IBM Connections' customers. Two of the most notorious improvements are related to the offerings change. The first, Forrester emphasizes, is that while connections 4.5 from April 2013 focused on the "full engagement workplace" instead of enterprise social solutions. The second is Kenexa, where IBM brings social to talent management in the same application. Forrester says: "Connections shines if you are looking for a broad, robust offering with strong integration across the IBM portfolio." (Koplowitz, Forrester Wave: Enterprise Social

Platforms, Q2 2014, 2014)

8.12 Microsoft Forrester Social Evaluation

Forrester evaluates Microsoft with Office 365 and Yammer. Yammer provides clear guidance that it supports the social engine with broader portfolio and capabilities. Office 365 include the Yammer integration for social with SharePoint supporting document management, team sites, among other essential functions for ECM. Forrester says: "Office 365 shines when you require a full suite of capabilities in a cloud environment and desire integration and alignment with the broad Microsoft portfolio." (Koplowitz, The Forrester Wave: Enterprise Social Platforms, Q2 2014, 2014)

8.13 Forrester Research Review Summary

Although both platforms offer enterprise content management features, in some aspects they are quite different to others, one is better than the other. Forrester researcher clearly shows that IBM scores better in most points than Microsoft Office365. However, there was a lack of comparison between IBM Connections social features with Yammer (Forrester total Economic Impact Study, 2015). Instead, Forrester evaluated Yammer against other Web Content Management platforms. On the other hand, it is understandable Forrester research decision because Yammer is a totally web-based application while Connections is a full on promises application that also can be used in the cloud. (Powers & Aponovich, 2013)

8.14 Summary of All Research Reviews

In Summary, Gartner's Magic Quadrant provide support to decision makers when deciding what to purchase by providing what IT systems are available in the market, the services vendor's provide and how well established they are considering the long-term commitment. These factors are critical to organization's decision-makers to manage the risks regarding which vendors to choose for a long-lasting

relationship. (Karen A. Hobert, 2016)

Porter-Roth (Porter-Roth, 2012) wrote an article for AIIM about Cloud Content Management in which he describes cloud computing as a service, which makes computing resources available through the internet. Cloud computing services range from online data storage such as Google Chrome, Dropbox, and OneDrive up to highly data processing applications such as Amazon Web Services, Window Azure, among others. Cloud content management can be described as a cloud application with the same document management functionality, which can be set up by the user without any IT support in little time and is web accessed through any device.

IBM ECM has undergone many product improvements, new strategic partnerships, including the company's vision of ECM, has evolved to keep up with the market demands. The highest scored has been achieved been in the "ability to execute" and "completeness of vision." (Msahmadi, 2015)

9 Comparison

This chapter focuses on drawing a comparison overview of both proprietary platforms and what has been taken into account for the ECM platform comparison with a table designed based on the research reviews and articles reviewed in this paper. The conclusions and recommendations are at the end of this chapter.

9.1 Comparison Overview

Although the main focus of this paper is the differences between both proprietary platforms. Is important to remember this paper has never had any intention to stress the value one platform over the other in any way. Both platforms have their strengths and weaknesses and will always be viewed by the customer as the perfect one depending on their needs and expectations based on what is important to them.

Due to the increasing popularity of Microsoft SharePoint in the past years, many customers from IBM partners, among other ECM manufacturers, lack the ability to compare all the major feature and capabilities among the ECM systems on the market without compromise. A reliable, valid and unbiased impartial scientific comparison between Microsoft SharePoint 2013 and IBM Connections 4.5 does not exist per se. There are many books and articles from Microsoft Press about Microsoft SharePoint 2013 as well as many articles available on IBM site about their ECM system. All of them provide a good overview of their particular proprietary ECM. However, they have no base to empirically and scientifically compare one with the other unbiased due to the fact both platforms focus on what they excel, excluding what they fall short and need to improve. For this reason, the author decided to use reliable and unbiased, independent research bodies' analysis that is well-known for their extensive research around the world providing an overview of what is the ECM market position and the positive and negative aspects of both platforms.

9.2   Comparison Table

In the Magic Quadrant, IBM ranks as a market leader in Gartner's research regarding ECM software revenue, mostly because of IBM's broad higher-value, their innovation, and the wide support for social, mobile, content management and analytics.

Microsoft and IBM, both came up as leaders in the Magic Quadrant and for that reason is important to show what Gartner's define as leaders.

Gartner defines leaders as:

> *"Leaders have the highest combined scores for Ability to Execute and Completeness of Vision. They are doing well and are prepared for the future with a clearly articulated vision. In the context of ECM, they have strong channel partners, presence in multiple regions, consistent financial performance, broad platform support and good customer support. They are very strong in one or more technologies or vertical markets. Leaders deliver a suite that addresses market demand for direct*

delivery of the majority of core components, although these are not necessarily owned by them, tightly integrated, unique or best-of-breed in each area. In our assessments, we look for demonstrated enterprise deployments, integration with other business applications and content repositories, incorporation of social, cloud and mobile capabilities, and vertical-process and horizontal-solution focus. Leaders should drive market transformation." (Koehler-Kruener;Chrin;& Hobert, 2015)

Here is IBM's strength and weaknesses in Gartner's research.

IBM CONNECTIONS SUITE STRENGHT	IBM CONNNETIONS SUITE CAUTIONS
Reduce complexity and is user-friendly with a new universal UI and content navigator.	Lack robust cloud strategy for ECM.
Focus on solutions that matter: Case Management, Patient Care and Insights, and Defensible Disposal. All these leverage content, predictive analytics, collaboration and social capabilities.	IBM is moving from product to solution-focused provider, which poses difficulties. There is confusion about IBM portfolio and the direction for the products. IBM relies on their partners and dealers to deliver solutions, and the Global Business Services marketing solutions are risking alienate their partners.
Support multinational enterprises in both mature and emerging markets.	It has too many content management and related repositories at the core of ECM and also among other applications its support.

Table 17: Table of IBM's strength and weakness based on Gartner's Magic Quadrant. (Karen A. Hobert, 2016)

The research shows one of IBM's most prominent weaknesses is the lack of robust cloud strategy that is one of Microsoft strongest points, even though Microsoft has fallen to challenge group 2016, it targets midmarket adopters of a cloud solution, which makes their cloud strategy strong. IBM is catching up partnering with Box to provide cloud-base synchronization and sharing to its clients the same way Microsoft does. (Karen A. Hobert, 2016)

Microsoft dropped from leader to challenge quadrant in Gartner's ECM research. (Karen A. Hobert, 2016) SharePoint Online as a component of the cloud-based Office

365 is the most significant accomplishment Microsoft has obtained. Gartner points out that more than half of Microsoft's ECM client interactions have SharePoint in one-way or another. Microsoft has improved their social integration and offers new collaboration and social products that are native to Office 365 and do not have integration issues. Although Microsoft Office 365 is one of the leaders on cloud-based offerings, continually improving their offerings, SharePoint 2016 server version, is not catching up and have lost the appeal to be upgraded. (Karen A. Hobert, 2016)

Microsoft's strength and weaknesses in Gartner's research are illustrated in Table 17 below:

MICROSOFT SHAREPOINT STRENGHT	MICROSOFT SHAREPOINT CAUTIONS
The Strong ecosystem around SharePoint with many third-party software vendors offering applications that extend SharePoint's capabilities. In 2016 Microsoft SharePoint part of Office 365 have solutions that will minimize the need for third-party offerings.	Among many challenges SharePoint faces expected adoption level and change management are the most prominent. Better UI (user interface) and flexible user experience are areas where SharePoint still need to work to improve.
SharePoint improvements in search and social interactions seem to be attracted people to migrate from earlier versions.	Some users still expect more native functionality in areas such as administration, backup and recovery, workflow, replication, mobile support and broad usability. Yammer's integrations into SharePoint is also a concern in SharePoint server that is on-premises.
Microsoft is viewed as a multi-faced solution that consolidates its strong market position, which justifies its continuing investment in ECM capabilities with the cloud, on-premises, and hybrid deployments.	Microsoft is pushing hard regarding the early adoption of Office 365, SharePoint and Yammer's and changes need time to occur and to build knowledge and skills to feel comfortable with the modification.
SharePoint Standard and Enterprise solutions include BI (Business Intelligence)	

that is a server through Excel services.	

Table 18: Table of Microsoft' strengths and weaknesses based on Gartner's research. (Karen A. Hobert, 2016)

9.3 Microsoft SharePoint and IBM Connections differences

No matter what the version of Microsoft SharePoint, it always have excels in the document management capabilities that vary from the basic storage and share to full range of features that complex organizations need to manage their documents, assets, knowledge and information. (Riley & White, 2013)

Although the social capabilities of SharePoint on-premises have been improved from previous versions, they are still far from being a match to IBM Connections social features. However, Microsoft is trying hard to compensate the lack of social features with the acquisition of Yammer, a web-based social platform that works much like "Facebook" but in a closed environment. The integration of Yammer with SharePoint Server has been an ongoing process during the writing of this paper, and no real case evaluation can be done yet to verify how well SharePoint and Yammer work together as one. Microsoft SharePoint is part of Office365, on the other hand, has been doing an amazing job constantly coming up with the new collaboration solutions such as Delve, Video and the new Flow that is a brand new app that allows workflows be built and managed by a Microsoft app. (Karen A. Hobert, 2016)

IBM Connections is complemented with full ECM capabilities through the IBM Connections Suite, which makes it a compelling ECM system platform to any organization. IBM lacks full cloud-based capabilities on the market, which makes it a weaker competitor compared to Microsoft that is already delivering and constantly improving their cloud solutions. IBM is actively working on cloud-based solutions, and it offers already IBM Connections cloud-based, however as their cloud solutions are not that mature, IBM does not put the effort on "forcing" their customer to migrate to a hybrid solution and even complete cloud solution as Microsoft is doing with Office 365. That is because IBM understands they sell mostly for big enterprises

and this market is not yet ready to migrate to complete hybrid systems. (Karen A. Hobert, 2016)

From the user perspective the most significant differences the author has been able to spot are shown in Table 18 below:

The Best of Connections:	The Best of SharePoint
PERSONALIZATION IBM have Widgets instead of Web Parts and just by dragging and dropping Widgets IBM users can change their environment without no need of training or difficulties at all. That is not the case with SharePoint, which the user needs to go to edit mode, make their changes, save and publish to see them done.	SEARCH Search in SharePoint 2013 and 2016 is excellent as the FAST technology was integrated within the platform.
MAIL INTEGRATION Mail is integrated within IBM Connections, and there is the ability to get it from this platform. Microsoft SharePoint is not integrated into SharePoint to receive e-mails the way IBM Connections is.	DOCUMENT MANAGEMENT SharePoint document management and assets capabilities are difficult to match by any other ECM on the market. SharePoint has target type document management, and with the web, application documents can be viewed and edited on the fly as web-based without no need of any client application. In Office 365 with Delve, it has been brought to a whole new level.
SOCIAL FEATURES Social features with Status Updates in IBM Sametime© chat give much of Yammer's feature to Connections that is far better than SharePoint 2013 and 2016 social feature can bring.	KNOWLEDGE MANAGEMENT – WIKIS SharePoint Wiki sites and page capabilities are available even in the free version that is the foundation. Due to the excellent search capabilities, the site communities in SharePoint Wiki do not need extras. IBM Connections has less powerful Wiki capabilities. IBM Confluence, which is an

	application that excels on wikis, is another solution that has to be purchased separately to complement IBM Connections.

Table 19: The best of Connections and SharePoint (Karen A. Hobert, 2016)

9.4   Summary

The conclusion from analyzing IBM Connections Suite and SharePoint as ECM systems is that although they are targeted to the ECM market, they are designed to fulfill different customer requirements. IBM Connections is clearly socially driven. However, it is capable of fulfilling the document management their clients may require from them. If customers need more capabilities IBM Connections cannot fulfill; IBM offers other solutions that can be purchased and seamlessly integrated to Connections.

Microsoft is clearly document sharing and management driven and offers a compelling cloud-based solution with constant innovations appealing to most of the clients while hybrid or purely cloud-based solutions are not an issue. (Karen A. Hobert, 2016)

In summary, Microsoft SharePoint and IBM Connections' differences are meant to be, as both deliver ECM solutions that fit their specific niche market and excel in what they do.

10   Conclusions and Reflection

In this information era, to be able to transform organizations' knowledge into valuable currency is a competitive advantage. ECM solutions allow organizations to customize their content and knowledge into their competitive advantage (Larrivee, 2013). In this final chapter the author concludes with first revealing the research applications, second review the research and the key questions, and finally, reflect on the findings.

10.1   Research Application

In this section, a summary of the application is concluded into a list of points with the aim of help vendor to self-assess their customers before they implement an ECM system.

The following Table 19 shows a short self-assessment tool to support sales people before the ECM project begins.

Please grade the following in order of importance for your company:

	ECM business drivers:	Grade from 1 to 5: 5 is the most important/ agree completely 1 is the least important/ disagree completely
1	Increase operational efficiency	○ 1 ○ 2 ○ 3 ○ 4 ○ 5
2	Cost reduction	○ 1 ○ 2 ○ 3 ○ 4 ○ 5
3	Enhance litigation support	○ 1 ○ 2 ○ 3 ○ 4 ○ 5
4	De-duplication of content	○ 1 ○ 2 ○ 3 ○ 4 ○ 5
5	Risk reduction	○ 1 ○ 2 ○ 3 ○ 4 ○ 5
6	Value-added services	○ 1 ○ 2 ○ 3 ○ 4 ○ 5
7	New ways of working	○ 1 ○ 2 ○ 3 ○ 4 ○ 5
8	My organization do not have any need to expose internal data externally	○ 1 ○ 2 ○ 3 ○ 4 ○ 5
9	The exposal of internal data externally is important to my organization	○ 1 ○ 2 ○ 3 ○ 4 ○ 5
10	Collaboration and knowledge sharing drives my business	○ 1 ○ 2 ○ 3 ○ 4 ○ 5
11	Document management and document sharing drives my business	○ 1 ○ 2 ○ 3 ○ 4 ○ 5
12	Taxonomy describes the way humans organize and classify content hierarchically. My organization already have its taxonomy determine, and there is no need to determine it before project implementation.	○ 1 ○ 2 ○ 3 ○ 4 ○ 5
13	Classification help information exposes data within groups that has a meaning to a specific industry. My organization already have all the classification about my specific industry in place.	○ 1 ○ 2 ○ 3 ○ 4 ○ 5

14	My organization have all the structured content specified	○ 1 ○ 2 ○ 3 ○ 4 ○ 5
15	My organization have all the unstructured content specified	○ 1 ○ 2 ○ 3 ○ 4 ○ 5
16	My industry is heavily controlled by law regarding document disposal	○ 1 ○ 2 ○ 3 ○ 4 ○ 5
17	My industry is not controlled by law regarding document disposal	○ 1 ○ 2 ○ 3 ○ 4 ○ 5
18	My organization is only interested in on-premises ECM system	○ 1 ○ 2 ○ 3 ○ 4 ○ 5
19	My organization is only interested in online ECM system	○ 1 ○ 2 ○ 3 ○ 4 ○ 5
20	My organization is only interested in ECM system hybrid options	○ 1 ○ 2 ○ 3 ○ 4 ○ 5
21	My organization is involving the end-user of this new ECM system all the way to ensure the new system will be useful to them.	○ 1 ○ 2 ○ 3 ○ 4 ○ 5
22	My organization is committed to providing training the key end-users and also provide in-house training to ensure the end-user know how to use the new ECM system.	○ 1 ○ 2 ○ 3 ○ 4 ○ 5
23	My organization is ready to commit to full-time employee(s) as ECM administrator(s) post-deployment that is trained on the specific ECM system implemented	○ 1 ○ 2 ○ 3 ○ 4 ○ 5
24	My organization is ready to commit to a full-time employee(s) to maintain the ECM system deployed.	○ 1 ○ 2 ○ 3 ○ 4 ○ 5
25	My organization is not ready to commit to a full-time employee(s) to maintain the ECM system deployed. However, it is ready to commit to a maintenance contract with the company which deployed the ECM system or any other that is knowledgeable in the system.	○ 1 ○ 2 ○ 3 ○ 4 ○ 5

Table 20: Research result - Short self-assessment designed to be used as sales tool

The author designed this list based on the Enterprise Content Management theory here presented. The list applies the one through the five-grade system; the result is intended to be useful to vendors to help their customers to carry out an easy and faster to answer self-assessment before implementing the ECM system. The result of the self-assessment should be used to compare to customer requirements. When differences are found they should be pointed out and discussed with the client before any ECM commitment. This additional process, which is non-existent at the moment in the industry, is a win-win situation where vendors help to protect customers from failing their ECM project whereas they protect themselves against

post-deployment issues due to customer's lack of commitment to the project success.

10.2   Review of the Research

Enterprise Content Management (ECM) allow organizations to take control over their information on a daily basis to perform their job effectively and efficiently. The main benefits are to cost reduction and efficiency on using their knowledge to their advantage.

What is ECM system and why organizations cannot afford to be without one?
The section Review of ECM Theory number defines Enterprise Content Management as a complex software system capable of creating, capture, store, organize and manage information. (Larrivee, 2013)

What can Microsoft SharePoint offer?
The section five and six reviews the features of Microsoft SharePoint versions on-premises 2013 and 2016 and SharePoint Online part of Office 365. (Microsoft TechNet, 2016)

What can IBM Connections offer?
Section seven reviews the features of IBM Connections Suite, including the plug-in IBM has to bring the social features from Connections to SharePoint. (Benitez, 2014)

How one, or both ECM platforms can complement each other?
The only platform that has a plug-in to complement the other is IBM Connections described in chapter seven. (Benitez, 2014)

What are the main differences between Microsoft SharePoint and IBM Connections?
Chapter nine focused on the differences between both proprietary platforms only with the purpose of showing the differences and applications of the system.

What are the points to consider when planning a successful ECM project?

The chapter Literature Review uses Bob Larrivee's article for AIIM as the theory based on this section. (Larrivee, 2013)

The qualitative and quantitative research were used in the research process. The qualitative research was based on electronic articles and books, and the quantitative research was based on public research bodies from 2013 to 2016.

Customers may be guilty of lack of knowledge, proper time and even resources in the long run. However, IT companies are also guilty if they do not properly inform their customers about the effort, resources and time needed to end up with a successful ECM full implementation. When end-users are not represented in the ECM project planning stage throughout the entire project, they might undermine the whole project implementations from lack of understanding. (Larrivee, 2013)

The most common explanation to acquire ECM systems is: the company must modernize and need new ways to improve their content workflow and security. However, rarely is the case where the end-user of the new ECM system is involved in the planning, development, deployment and post-deployment process. If the end-user is not trained properly and is not shown the benefits of changing to the new system, they might continue to use what is easier and familiar to them. The success of any ECM project, and in fact to any IT system implementation, is the understanding and commitment of the end-use to the new system. People are busy, and nobody has the time or energy to let aside their urgent daily tasks to learn, on their own, how to use a new system that will ultimately benefit the organization. It is important to be reminded that are decision-makers who purchase the system: IT systems that are not tailored to the benefit the end-user needs. That is a huge risk to fail in the long run. (Larrivee, 2013)

10.3   Reflection

Microsoft SharePoint and IBM Connections Suite are Enterprise Content Management platforms that provide similar features with different context perspectives. The perspective for Microsoft SharePoint begins with the document

and permission management. On top of them, is the ability to work collaboratively through collaborations sites and site collections is added. SharePoint has social features that although have been improved in the new version of SharePoint on-premises new version, however, SharePoint social capabilities still differ from on-premises and Office 365. The perspective for IBM Connections, on the other hand, starts with social networking and the ability to connect and share status updates, documents, assets and knowledge and the ability to real-time communicate. The social network is the basis of IBM Connections Suite and everything else is a consequence of people interaction.

IBM has a plug-in solution Connection's Plug-in solution that brings the best of Social feature right into SharePoint for the customer that need SharePoint Content Management capabilities when they have IBM Connections and active directory.

It is imperative to notice that cloud-based social features impose security risks that organizations in many cases are not willing to take. IBM delivers on-premises and mobile versions of their social features as client-based that is a much more secure option than Microsoft Yammer that is completely web-based. Time will tell how customers will adopt the technology and how much big enterprises and government are willing to take the risk of web-based social applications.

ECM systems are not a single, straightforward and self-explanatory product, no matter if the vendor is Microsoft, IBM or any other in the market. Many business processes within a company are common to all organizations. However, the reason SharePoint and IBM Connections are chosen is for their ability be customizable according to the customer's requirements.

The paper concludes with a short list of twenty-five items designed to be used as customers' self-evaluation. IT companies may use the self-assessment list to evaluate if their clients have an ECM strategy in place that match with their ECM requirements. The purpose of this short questionnaire would be to become tools which increase awareness of the differences between the requirements customers submit to IT companies and what the decision-makers have in mind when

committing to a complex IT system.

Call for future new research would be needed to determine how useful the self-assessment list is and what are the refinements it needs.

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