Universidade do Minho
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Adoption of Enterprise Social Networks in the Context of a Multinational Organization: the Case of Yammer

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Mestrado integrado em Engenharia e Gestão de Sistemas de Informação

Trabalho efetuado sob a orientação do
Professor Doutor Rui Dinis Sousa

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RESUMO

Num mundo globalizado, onde as empresas operam em diferentes localizações e o trabalho é cada vez mais complexo, a colaboração entre os trabalhadores surge para aumentar a eficiência no desempenho de tarefas. No seguimento do desenvolvimento tecnológico e social, as empresas investem em tecnologia de colaboração para suportar esta realidade. Contudo, o problema da aceitação e uso da tecnologia continua presente. O processo de adoção de uma tecnologia é complexo e nem sempre decorre sem percalços, mesmo quando as suas vantagens são óbvias.

Esta dissertação de mestrado tem como objetivo estudar o fenómeno da adoção e uso do Yammer, uma *Enterprise Social Network* (ESN), numa empresa multinacional. Mais especificamente, esta iniciativa de investigação procura responder à questão de investigação "Como é que o processo de adoção e introdução de ESN, ao nível organizacional, influencia o uso de ESN, ao nível individual?", através da análise do processo de introdução do Yammer na empresa e dos fatores que influenciam o uso da plataforma.

Este documento apresenta uma descrição e uma análise crítica do processo de introdução do Yammer na empresa, um conjunto de testemunhos de utilizadores que expressam as suas opiniões sobre a tecnologia e o processo de desenvolvimento, condução e análise de um inquérito que tem como objetivo evidenciar os fatores que influenciam o uso do Yammer.

Os resultados demonstram que o Yammer foi introduzido na empresa em fases e que diversas iniciativas foram desenvolvidas para difundi-lo pela organização, contudo não foi possível relacionar o sucesso dessas iniciativas com a evolução do desenvolvimento da rede social. O modelo explicativo para o uso do Yammer, desenvolvido e testado ao longo da investigação, explica 58,2% da variância do uso. O imediatismo da comunicação, a massa critica de utilizadores, o suporte da gestão, a acessibilidade da plataforma, a experiência tecnológica, o tempo e a expectativa de valor assumem-se como os mediadores mais importantes do uso.

Por fim, apresentam-se recomendações para ajudar as organizações que pretendem iniciar processos de introdução de tecnologia semelhantes.

PALAVRAS-CHAVE: TECNOLOGIA DE COLABORAÇÃO, REDES SOCIAIS EMPRESARIAIS, ADOÇÃO DE ESN, INTRODUÇÃO DE ESN, USO DE ESN

ABSTRACT

In a globalized world, where companies operate across different locations and where work becomes increasingly complex, collaboration arises between employees to perform tasks more efficiently. Following technological and social development, companies invest in collaboration technologies to support this new reality. However, the problem of technology acceptance and use is still present. The process of adopting a new technology is complex and not always happens smoothly, even when its advantages are obvious.

This master dissertation has the goal to study the phenomenon of the adoption and use of Yammer, an Enterprise Social Network (ESN), in a worldwide company. More specifically, this research study pursuits the objective of answering the following research question "How does ESN adoption and implementation process, at organizational level, influence ESN use, at the individual level?", by analysing both Yammer introduction process in the company and the factors that influence the use of the platform.

This document provides a description and critical analysis of the introduction process of Yammer in the company, a set of testimonials from end-users that express their feelings and opinions regarding the technology and a description of the development, conduction and analysis processes of a survey that was used to highlight the factors influencing Yammer use.

Findings show Yammer was introduced in the company in phases and different initiatives were developed to disseminate Yammer through the organization, however it was not possible to clearly relate the success of these initiatives with the level of development of the network. The model for Yammer usage developed and tested along the research explains 58,2% of the variance. Communication Immediacy, Critical Mass, Management Support, Platform Accessibility, Technological Experience, Time and Value Expectancy ended to be the most important factors influencing Yammer usage.

In the end, a set of recommendations regarding the adoption and introduction process of ESNs was formulated with the goal to help organizations that intend to undertake in similar processes. This work also extends the existent research in the fields of technology adoption, innovation diffusion and ESN adoption and use.

KEYWORDS: COLLABORATION TECHNOLOGY, ENTERPRISE SOCIAL NETWORKS, ESN ADOPTION, ESN INTRODUCTION PROCESS, ESN USAGE

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LIST OF ABBREVIATIONS AND ACRONYMS

AVE	Average Variance Extracted
AUCT	Adoption and Use of Collaboration Technology
CAQDAS	Computer Assisted Qualitative Data Analysis Software
CT	Collaboration Technology
ERP	Enterprise Resource Planning
ESM	Enterprise Social Media
ESN	Enterprise Social Network
ESS	Enterprise Social Software
IS	Information Systems
IT	Information Technology
LV	Latent Variable
MO	Market Organization
OSN	Online Social Network
PLS	Partial Least Squares
SEM	Structural Equations Modelling
SMS	Short Message Service
SRNS	Social Research Network Sites
TAM	Technology Acceptance Model
UTAUT	Unified Theory of Acceptance and Use of Technology
VIF	Variation Inflation Factor

1. INTRODUCTION

We are living in a context of fast technological and social development. Technology is present across all sectors of society, shaping the structure of organizations and influencing the interactions among individuals. Therefore, if in one hand organisations have at their disposal a great diversity of technologies, on the other hand, it is important to understand which are the right technologies to fulfil current business and work structure needs.

First computers were introduced in organizations to execute routine tasks more efficiently. The introduction of Information Technology (IT) in organizations supported management with better information, reducing the need for direct supervision and giving workers more autonomy to perform their tasks (Bresnahan, Brynjolfsson, & Hitt, 1999). Indeed, information has become one of the most important organizational resources and Information Systems (IS) gained a central position in organizations supporting their strategy and decision-making processes, and making them better prepared to adapt to environmental changes (Kalkan, Erdil, & Çetinkaya, 2011).

However, in a time when work is increasingly demanding and complex, individuals and isolated groups are not as effective as teams. Collaborative work, i.e., combination of individual efforts to accomplish a specific objective, or in a simple way, just "working together", it is now becoming increasingly important for organizations. Organizations need to remove their internal barriers, among individuals and groups, to better deal with complex and demanding situations (M. Beyerlein, Freedman, McGee, & Moran, 2002). Following this way of thinking, companies have invested in Collaboration Technology (CT), for decades now, to provide their employees with tools supporting collaborative work (Bharadwaj, El Sawy, Pavlou, & Venkatraman, 2013).

If in one side, it is stated that the benefits achieved with the introduction of new IT can rapidly start decreasing when a lack of alignment between IT and business strategies exists, increasing the risk of IT failure and the decline in competitive ability (Bharadwaj et al., 2013; Rathnam, Johnsen, & Wen, 2005; Tapandjieva, Marchetti, Rychkova, & Wegmann, 2013), on the other side, there is the problem of technology acceptance and use.

This master dissertation focuses in these topics by studying the adoption and use of a CT in the context of a multinational organization.

1.1 Organizational and technological backgrounds

1.1.1 Organization

This master dissertation will be developed in cooperation with a company which provides all the support needed through the research process. However, due to data privacy issues, the company can't be identified in this document. Every time a direct reference to the company is needed, the name LSA will be used.

LSA is a multinational company with headquarters located in the German-speaking area. It is present in more than 120 countries and it employs more than 23 000 people around the world. The company has a direct sales model, which means LSA sells the products it produces, controlling all the process from research and development to sales. It is an innovative company, highly technological driven and currently embracing highly-demanding and complex technological implementation projects. Beyond the headquarters facilities, there is a LSA market organization (MO) in almost every country where the company is present. Each MO has a similar organizational structure and its responsible for selling LSA products and services in that specific country.

The company has a diversified technological landscape. Depending on task and department, there are numerous software applications in use, however, SAP ERP is the global solution for supporting business processes and Microsoft Office 365 applications are the global solution for personal and team productivity. Yammer is one of the applications provided by Microsoft in Office 365 package.

Yammer is an Enterprise Social Network (ESN) that was introduced in LSA to create a place where everyone could easily interact with each other, in a networking, collaboration and knowledge exchange basis. Even though each employee has its own profile where he or she can add personal information, unlike Online Social Networks (OSN), all the interaction happens inside groups and it is impossible to publish messages in personal feeds. ESN has the main purpose to achieve organizational and not personal goals, thereby, employees need to join specific groups and interact on top of specific topics and subjects.

In LSA's Yammer network, among other examples, there are groups used for supporting small team work, to connect employees that work in retail across the globe or to spread information inside a specific MO. In the great majority of the groups, it is possible to identify knowledge exchange initiatives, Q&A interaction and business success sharing. Yammer ends up being a good way to find people with

specific expertise and to get updated about the initiatives that other MOs, from different countries and continents, are developing.

In LSA, there is a current satisfaction with Yammer as the percentage of engagement – percentage of users that at least access the network once in a week - is steadily higher than 40% and the total number of users has crossed the twenty thousand barrier. However, it is still possible to identify great disparities in engagement rates across different locations of the globe. If in some Western European MOs, the engagement percentages are week after week above 80 or 90%, in some other MOs from Eastern Europe, Africa or Asia, engagement rates are very low, sometimes even below 20%.

Therefore, LSA feels the need to understand the reasons behind such disparities in order to react and increase Yammer usage in those locations.

1.1.2 Yammer

Yammer is an Enterprise Social Network that was launched in September of 2008. In 2012, Microsoft bought Yammer for 1,2 billion dollars. In that year, 85 percent of the Fortune 500 companies were using the platform (Bell, 2012).

Yammer, in its basic version, is a freemium enterprise software, but customers can pay to have additional administrative and security features (Bell, 2012). It is organized based on the concept of networks, which means each company as its own network. Everyone can create a network for their company by registering the respective corporate email. Then, everyone in the company will be able to join the network using their professional email (D. Richter, Richter, Hamann, Riemer, & Vehring, 2013).

Even though Yammer appears to be similar to other social networks, it presents functionality differences which distinguish it from them. In Yammer, everyone has access to the profiles and activity reports from all users, being possible to follow a specific user in order to be notified and get more information about his or her activity in the network. On the other side, the network is based in groups, which means a user can only post inside a specific group. Then, the content posted becomes available to all the users who have access to the group (D. Richter et al., 2013). All the networks have a global group called All Company, which has automatic membership. That means all users are automatically members of All Company group when they join the network. Other groups can have different privacy and membership policies (Microsoft, 2017b).

On Yammer, messages are not length limited and it is possible to attach different types of multimedia content as photos, videos, documents or links to a single post. Replies to a specific post are

shown below the it, creating a conversation thread. (Riemer & Scifleet, 2012) Besides usual posts, it is also possible to create polls - in order to ask people's opinion about a specific topic -, praise messages - in order to acknowledge someone for a good achievement - and announcements - feature only available for group administrators as every time an announcement is posted, an email notification is also sent to each group member's mail inbox. Like in other social network sites, users can upload a profile photo, fill some personal information as interests or professional background and change language and notification settings. Yammer also provides a private chat to contact other network users (Microsoft, 2017a).

Microsoft is continually improving the platform not only by releasing new features, but also by improving its look and feel. Besides being possible to access Yammer using a browser, Microsoft also provides mobile and desktop apps (Microsoft, 2017a).

1.1.3 Tryane Yammer Analytics

Tryane is a French company which provides a web analytics application that tracks Yammer performance. Tryane Yammer Analytics dashboard provides information in seven distinct categories: members, engagement, groups, topics, activity, profiles and benchmarks (Tryane, 2017), see Table 1.

Table 1: Categories of indicators available on Tryane Yammer Analytics

Category	Functionalities
Members	Number of members; Percentage of engagement; Percentage of users by adoption profile.
Adoption	Number of members, connected users, monthly active users and daily active users; Stickiness (percentage of recurring users).
Groups	Number of groups and private groups; Ranking of active groups; Ranking of the most attractive groups (higher number of new members).
Topics (hashtags)	Total number of topics; Hot topics.
Activity	Number of posts, comments, shares, likes, private messages and documents.
Profiles	Percentage of profiles with picture, skills and interests.
Benchmark	Comparison of Yammer network performance with Yammer networks, from other companies of the same industry or size, in categories like engagement, groups, activity and documents.

Besides Tryane Yammer Analytics administrators, who have access to all the indicators available, each Yammer group's manager is also able to see analytics from the groups they manage. They can access information about the evolution of the number of members and engaged members and they can also see group activity indicators as number of posts, comments, shares, likes and documents shared. In addition to that, it is also possible to see the ranking of the most influential users, the most viewed documents and announcements, the most participated discussions and the most discussed topics (Tryane, 2017). The tool becomes helpful for group managers by enabling the identification of group successes - most active topics, most read documents or top conversations - and failures. With that information, they can shape the way they communicate, the type of content they publish and the initiatives they develop to meet group members' expectations and keep the engagement high.

If the basic information provided by the platform is already useful to understand the levels of adoption and the usage patterns inside the network, Tryane Yammer Analytics also provides the possibility to integrate Yammer users' external data in order to increase the analytic capabilities of the platform (Tryane, 2017). At LSA, this tool is integrated with the company's Azure Active Directory, and, thereby, it is possible to filter the network activity information according to different user characteristics as location or job title. By filtering engagement information by user location, it is possible to identify disparities in Yammer usage among different MOs. These insights add value because, potentially, LSA can channel specific awareness initiatives to specific groups of users that are not engaging with the platform as much as other users with the goal to fight those usage disparities.

1.2 Motivation and objectives

Along the years, there was a big focus on the research field of acceptance and use of technology. The Unified Theory of Acceptance and Use of Technology (UTAUT) appeared to unify findings from past research initiatives (Venkatesh, G . Morris, B . Davis, & D . Davis, 2003). More recently, some research in the field of acceptance of collaboration technology was developed (Brown, Dennis, & Venkatesh, 2010; Dennis, Venkatesh, & Ramesh, 2003) following the argument that technology-specific models provide better insights, allowing to design proper approaches to foster technology adoption (Brown et al., 2010). Following this line of thought, models explaining ESN adoption and use are useful to support companies that introduced or intend to introduce ESNs in their organizational contexts.

This master dissertation has the purpose to study the adoption and use of Yammer in LSA. Even though efforts initiated in the past to create awareness around the tool and support users continue to be developed in the present, LSA feels it is lacking a solid strategic approach to deal with usage rates disparities among different MOs.

Therefore, this research initiatives will be divided in two parts. In Part I, the focus will be the adoption and introduction process of Yammer in the company. The description and analysis of the process has the intention to identify successful and not successful actions that were undertaken in the past in order to develop and apply mitigation strategies in the present and future. In Part II, the focus will be individuals' Yammer usage. Thereby, the goal is to identify a set of factors that influence the usage of the platform. The combination of these two dimensions of study will produce meaningful insights into the issue of Yammer adoption, introduction and use at LSA.

Adding to this, this master dissertation wants to contribute to the research field of ESN adoption and use. The description of Yammer adoption and introduction process at LSA and the development of a model explaining the phenomenon of Yammer usage, in this multinational corporation, can be helpful for other organizations that intend to undergo in similar introduction processes or that suffer from adoption/usage problems like LSA.

As a summary, this master dissertation has three objectives:

1. Describe and analyse Yammer adoption and introduction process, at organizational level;
2. Identify the factors influencing Yammer use, at individual level;
3. Formulate a set of recommendations to help organizations that undertake in ESN adoption and introduction processes.

1.3 Study description

This research initiative starts with a literature review, which provides a framework to contextualize the study with findings from past research initiatives, in order to assess the state of the art and to identify research opportunities (Creswell, 2014). The literature review was conducted through four iteration phases and using several online libraries as described in section 2.1. The literature review was important to define the research question as it tries both to solve the existent organizational problem and to contribute to the research field of ESN adoption and use.

1.3.1 Research questions and expected results

There are brief case studies which describe different ESN introduction processes in organizations and which present a set of learnings that arose from those studies - e.g. Turban et al. (2011) and Gibbs et al. (2015). The same way, there are research initiatives that have formulated models for ESN adoption and use - e.g. Ortbach & Recker (2014) and C. P. Chin & Choo (2015). These studies provide useful input for the research field of ESN, however a gap still exists when it comes to relate ESN adoption and introduction process, at organizational level, with ESN use, at the individual level.

Therefore, this master dissertation has the purpose of answering the following research question:

- How does ESN adoption and introduction process, at organizational level, influence ESN use, at the individual level?

The research question unfolds in two sub-research questions:

- How was Yammer adopted and introduced at LSA?
- What are the factors influencing individuals' use of Yammer at LSA?

As a direct result of this study, it is expected:

1. a description of the adoption and introduction process of Yammer at LSA as well a comparison of this same process with some of the learnings from the literature, in order to identify least and more successful initiatives undertaken;
2. a model for Yammer usage in this organisational context, which identifies the factors influencing the usage of the platform;
3. a set of recommendations to support organizations that intend to introduce ESNs. Even though this research is based on a specific technology in a specific organization, learnings will potentially not only help them to design better ESN introduction processes, but also to understand which are the most relevant factors leveraging the usage of the platform.

In the end, findings will allow to answer the research question, by relating Yammer adoption and introduction process with the factors influencing the individual usage of the platform, and will be instrumented in a set of recommendations to be used by organizations in the future. Even though it is

not directly addressed in this document, for LSA, the identification of the factors influencing Yammer usage will be an important input to develop a Yammer strategic plan of action for the incoming years, to deal with the usage disparities explained in section 1.1.1.

1.3.2 Research methodology

This study resorts on different methodological approaches to answer both the research question and sub-research questions. Each sub-research question will be addressed in different moments or parts of the study. The first sub-research question (Part I) - How was Yammer adopted and introduced at LSA? - follows a qualitative methodological approach in order to collect and analyse a set of historical information about Yammer introduction process in the company. The second sub-research question (Part II) - What are the factors influencing individuals' use of Yammer at LSA? - follows a mixed methods approach, more specifically, an exploratory sequential mixed method, which means that a qualitative research will precede a quantitative research. This methodological approach was chosen because it allows to collect a set of perceptions from users that will then be used as basis for the quantitative research (Creswell, 2014) with the intention to validate those perceptions globally in the organization.

Table 2 presents a holistic overview of the methodological approach for this research study.

Table 2: Methodology overview

	Part I	Part II	
		Phase 1	Phase 2
Sub-research question	How was Yammer adopted and introduced at LSA?	What are the factors influencing individuals' use of Yammer at LSA?	
Research approach	Qualitative	Mix methods	
Philosophical overview	Pragmatic Worldview	Pragmatic Worldview	
Research design	Qualitative	Exploratory sequential mixed method	
Strategy of inquiry	Qualitative	Qualitative	Quantitative
Research methods	Case study	Multiple case study	Survey research
Data collection methods	Document analysis Semi-structured interviews Analytics analysis	Semi-structured interviews	Questionnaire
Data analysis methods	Content analysis	Content analysis	Structural equations modelling (SEM)

Even though the research approach differs from Part I to Part II, the study follows a Pragmatic Worldview. This philosophical world view emphasizes on the research problem and on the use of all

available approaches to study the problem. The researcher is free to choose the approach (methods, techniques, and procedures) for collecting and analysing data he or she wants to follow to best meet research needs and purpose (Creswell, 2014). In this case, following a Pragmatic Worldview allows to study the problem of Yammer adoption and use holistically by using all sources of information, both quantitative and qualitative, that are useful to get a full understanding of the problem.

In each section of the document, the methodological approach applied will be further developed in order to explain the way research was conducted.

1.4 Structure of the document

This document is divided in eight chapters.

In the first chapter - Introduction - the organizational and technological backgrounds are described in order to contextualize this research initiative by identifying the problems the organization is facing. The motivation of the research is identified and a set of objectives as well. It is also presented an overview of the research methodology and, at last, the structure of the document.

In the second chapter - Literature Review - findings from the literature review are highlighted. In the first place, the overview of the concepts Collaboration Technology, Enterprise Social Software and Enterprise Social Media has the intention to clarify and structure these groups of technologies that frequently overlap. Then, the concept of Enterprise Social Network is explored. The process of innovation diffusion is presented both at the organizational and individual level. Related to the topic, some models that address the issue of technology adoption and use are presented and analysed. At last, overall findings about the organizational process of adoption and implementation of such technologies are highlighted.

The third chapter - Part I – How was Yammer adopted and introduced at LSA - has the objective of answering the first sub-research question and starts with the description of the methodological approach followed in this section. A detailed description of data collection and analysis methods is presented. Findings are explored in different sections according to the phases the adoption and introduction process of Yammer at LSA was divided. An analysis of the evolution of number of members in the network is also presented. To finalize, discussion section highlights findings and compares them with learnings from past literature.

The fourth chapter - Part II – What are the factors influencing individuals' use of Yammer at LSA? - intends to answer the second sub-research question and starts with the description of the

methodological approach followed in this section. The section is dived in two phases: Phase 1 and Phase 2.

- Phase 1 starts with a detailed description of the data collection and data analysis methods used, followed by a description of findings. A set of 12 interviews were conducted at LSA with the goal to collect users' perceptions regarding Yammer. Findings consist on a set of categories of factors with the potential to impact Yammer use and a set of propositions linking those same factors.
- Phase 2 consists in a survey research and has the objective to validate the factors previously identified. This phase also starts with a detailed description of the data collection and data analysis methods. After that, propositions and factors, from Phase 1, are operationalized in hypothesis and variables, so that they can be tested. The process of instrument development is described in detail. Thereafter, there is a description of the survey conduction process. On findings section, it is possible to see the assessment of the SEM model. To conclude, in discussion section, findings are analysed and compared with findings form past research initiatives.

The fifth chapter – Conclusion - is divided in four sections - Contribution and implication, Limitations, Recommendations and Final considerations. Contribution and implication section addresses the findings of this research study and highlights its impact for the state of the art of ESN. Limitations section presents the limitative factors that have conditioned this study. Recommendations section presents a list of good practices that organizations should follow when introducing ESN. Final considerations section presents the final thoughts regarding the importance of the study.

The sixth chapter contains the references used in the document.

The seventh and eighth chapter comprise two appendixes.

2. LITERATURE REVIEW

2.1 Methodological approach

This literature review was conducted through an iterative process with four phases. In the first phase, a search for several keywords, see Table 1, was made in AIS eLibrary, Web of Science, IEEE Xplore Direct, Research Gate and Science Direct. Search parameters where set in order to retrieve articles that were published in journals or conference proceedings, after 2012, and in which the keywords are present in the title and/or in the abstract.

Table 1: Key words used in the literature review

Key words	Reason
• "Collaboration technology"	To obtain documents explaining the role of collaboration technologies in organizations
• "Web 2.0" • "Enterprise 2.0"	To obtain documents describing the changes motivated by the incorporation of "Web 2.0" and "Enterprise 2.0" principles in public and organizational applications
• "Enterprise Social Media" • "Enterprise Social Software" • "Enterprise Social Networks"	To obtain documents describing these technologies as they that mark a new paradigm of collaboration in companies
• "Yammer"	To obtain documents about the collaboration technology in study
• "Technology adoption", • "Technology acceptance", • "Innovation diffusion"	To obtain documents about the process of innovation diffusion and technology adoption and use to understand the factors influencing them

In the second phase, titles and abstracts from all the articles were read in order to assess if they were effectively related to the research topic. In the third phase, the introduction and conclusion sections of the remaining articles were analysed to evaluate if they were useful for the research. The articles without free access to the full document were excluded as well.

In the fourth phase, Google Scholar was used to search for articles without applying any kind of filters. This search for articles had the intention to find the most relevant articles (high number of

citations) across different libraries to fill gaps of content in the literature review. During the reading process, other articles were also downloaded following go backward references.

2.2 Collaboration Technology, Enterprise Social Software and Enterprise Social Media

Collaboration Technology (CT) is a set of technologies used to support collaboration and communication among virtual groups, facilitating knowledge sharing and decision-making processes (Samarah & Paul, 2007), across different time zones, locations (Wyatt & Traietti, 2016) and hierarchies, where the individuals are free to define their patterns to mediate the interaction (McAfee, 2011).

CT first prototypes appeared in the eighties and focused in providing solutions for desktop videoconferencing, workgroup computing and document management. In this decade, text based communication technologies like email became the most adopted ones. In the nineties, email was already highly diffused, when groupware systems integrating email, calendars, task management and document coordination started to appear in the market. In the same decade, the development of the Internet came with an increasing demand for collaboration technologies. Internet-based software led to the development of diverse Internet-based collaboration technologies. Large scale collaboration platforms also started to appear either by incorporation of collaboration and communication features in pre-existent software as by acquisition of smaller vendors specialized in the area (Riemer, Steinfield, & Vogel, 2009).

Riemer et al. (2009) explain the adoption of CT has a result of market, organizational and technological trends. The emergence of global and liberalized markets, the increasing demand for information and knowledge sharing and the high pressures to constantly innovate led organizations to change their work structures. If in one hand, companies increased their cooperation with external entities, on the other hand, work became distributed across different locations and virtual teams naturally appeared has a response to the new reality. Therefore, CT is becoming increasingly used as it emerges as a solution for supporting work in these organizational contexts.

Over the past decade, the time employees spent in collaboration activities has increased by 50%. It is mandatory for companies and CT providers to examine how their technologies really support collaboration in order to enable employees to better connect and collaborate with higher levels of productivity and decision accuracy (Wyatt & Traietti, 2016). However, each team incorporates CT in its work routines differently, so organizations can't use the same approach to the entire organization (Maruping & Magni, 2015).

The adoption of Web 2.0 principles in terms of interactivity, user interfaces or democratization of content creation led to the development of new forms of collaboration technologies (Riemer et al., 2009).

Web 2.0 describes an all new set of services (Raeth, Kügler, & Smolnik, 2011) "that enable users to communicate, create content and share it with each other via communities, social networks and virtual worlds more easily than before" (Jussila, Kärkkäinen, & Aramo-Immonen, 2014), however, Enterprise 2.0 is the concept that marks the adoption of Web 2.0 principles in the organizational applications (Riemer & Tavakoli, 2013). For Bhansali & Brynjolfsson (2008), Enterprise 2.0 is the use of digital environments to promote collaboration within an organization. Bughin (2015) focus in its social features, describing Enterprise 2.0 tools as a set of web-based social technologies.

Concepts such as Enterprise Social Software (ESS) or Enterprise Social Media (ESM) have arisen together with Enterprise 2.0. Social Media can be defined as a group of Internet-based applications based on Web 2.0 principles that allow the creation and exchange of user generated content. Enterprise Social Media is the application of Social Media in organizations (Wehner, Ritter, & Leist, 2017). Enterprise Social Software seems to go beyond, supporting individuals and teams planning, discussing and organizing work, sharing knowledge and best practices across the whole organization or just learning with others' expertise (Drakos, Mann, & Rozwell, 2010). Social software helps employees and team members working together on cognitive tasks and sharing information and knowledge (Zeiller & Schauer, 2011).

In the field of research of Web 2.0 and Enterprise 2.0 is evident a constant overlapping of concepts. Definitions for Enterprise Social Media by Wehner et al. (2016) and for Enterprise Social Software by Drakos et al. (2010) are somehow similar and seem to describe related sets of technologies. As an example, blogs, wikis or social networking sites are pointed at the same time as examples of social media applications, (Wehner et al., 2017) and social software (Kugler, Smolnik, & Raeth, 2013; Zeiller & Schauer, 2011). For Qi & Chau (2016), Enterprise Social Media and Enterprise 2.0 are even defined the same way.

To make it clearer, in Figure 1, it is possible to visualize the relation between these set of technologies with examples of specific software solutions.

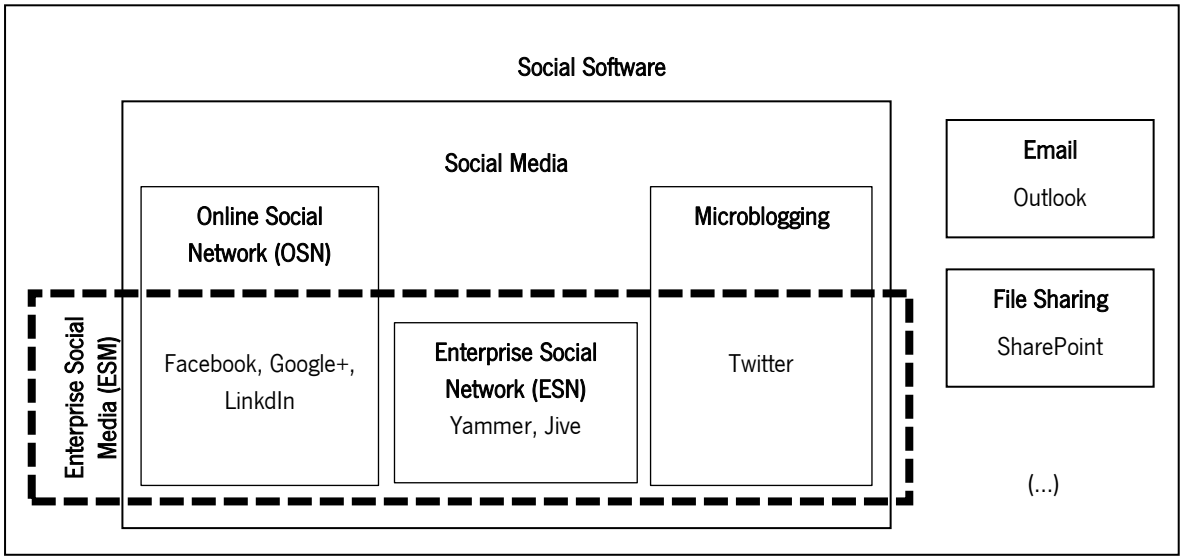


Figure 1: Relation between Social Software, Social Media and Enterprise Social Media
Adapted from Wehner et al. (2016)

There are several examples of Social Media platforms. OSNs like Facebook or Google+, Microblogging platforms like Twitter, or video sharing platforms like YouTube are well-known platforms worldwide. ESNs are specially designed and implemented for internal organizational use (Wehner et al., 2017). Yammer, Jive, or IBM Connections are examples of ESNs (Gotta, Drakos, & Mann, 2015). SharePoint, from Microsoft, is identified as belonging to Social Software category (Drakos et al., 2010).

All these technologies enhance the increasing usage of social features within organizational applications to support collaboration, innovation, communication and knowledge exchange (Qi & Chau, 2016; Stieglitz & Dang-Xuan, 2011; Zeiller & Schauer, 2011).

The world of digital technologies enables work to be carried out independently of time, distance, or task. This new working strategy relies on rich information exchange, communication, and connectivity through digital platforms inside and outside of the organization. If this new paradigm can be an opportunity to explore new ways of doing business and operate in contexts that didn't existed before, it can also be an opportunity to increase communication and collaboration inside an organization, enabling employees to easily share their knowledge in a value co-creation perspective (Bharadwaj et al., 2013).

2.3 Enterprise Social Networks

Enterprise Social Networks are social networks (e.g. as Facebook), but tailored to meet specific requirements of the organizational context, as a means to engage and connect employees, to boost collaboration, communication or information exchange, and to create community feeling (Bell, 2012; Hacker, Bodendorf, & Lorenz, 2017; Riemer & Tavakoli, 2013).

Different authors use different denominations when they address ESN topics, e.g., Social Networking Technologies (Ortbach & Recker, 2014) or Enterprise Social Networking Systems (Qi & Chau, 2016). According to Wehner et al. (2016) this is an evidence of a young research field that is still in development.

The will to make profitable use of social networks, which are very popular in public networks, makes companies to bring them to inside the organization (Xiong, Chen, & Zhao, 2014). Indeed, ESNs introduce an all new set of possibilities. By increasing interaction between employees and encouraging collaboration and communication, social features are being incorporated in knowledge management infrastructures to capture tacit, social and individual knowledge (Anderson & Mohan, 2011; Wehner et al., 2017). These technologies become very important in large and distributed companies to support knowledge sharing among individuals, teams and units spread by different geographical locations and time zones (Ellison, Gibbs, & Weber, 2015). Employees choose to meet new people instead of just reaching out to people they already know, sharing work and non-work-related content, and using the platform to spread messages to larger audiences (Dimicco et al., 2008).

Riemer & Richter (2012) propose a S.O.C.I.A.L. framework of ESNs use cases, which categorizes ESN activity in five categories:

- Socializing: social praise and informal talk;
- Organising: work coordination and meeting organisation;
- Crowdsourcing: problem solving and idea generation;
- Information: information sharing, input generation and document storage;
- Awareness: awareness creation, status updates and event notification;
- Learning & Linkages: discussion & opinion, making connections, learn about others, and build common ground.

Usually, these platforms support social media functionalities such as status updates, microblogging, groups and communities, instant messaging, or content management in a similar way as

the most well-known Online Social Networks (OSN). There are also personal profiles, the possibility to like and comment content and to follow or unfollow different users (Leonardi, Huysman, & Steinfield, 2013).

Nevertheless, there are distinctive aspects between OSNs and ESNs. In ESNs, a user can potentially interact with everyone in the network, user behaviour is influenced by organizational pre-defined guidelines and the main purpose of using it is to accomplish work-related goals. On the other hand, in OSNs, the audience can be restricted to a group of people to whom he or she potentially identifies with, the norms are defined by the platform and the primary intention of use relates with social and interpersonal goals. In ESNs the use may be optional or mandatory and, to some extent, the user also has privacy control (Cao, Gao, Li, & Friedman, 2013; Ellison et al., 2015).

However, there are problems related with the real assessment of ESN benefits, the way ESN implementation process is undertaken and the adoption of such technologies by end-users.

One of the main difficulties when deciding to implement these technologies is precisely the measurement of its benefits. Steinhueser, Herzog, & Richter (2015) propose a set of indicators and barriers to measure ESS expenditures, assets, use and organizational performance impacts. In the same field of research, Herzog et al. (2013) suggest usage and business value as the two main dimensions for ESS success measurement and present a set of methods and metrics to assess these two dimensions. A. Richter, Heidemann, Klier, & Behrendt (2013) propose a very similar approach that identifies measures for seven specific ESN use cases. The resulting Success Measurement Framework is also structured in the dimensions: usage and business value. The authors distinguish between the measurement of the usage of the platform - usually assessed using analytics platforms - and the measurement of ESN usage organisational impact. Business value can be measured in the form of business cases analysis or return on investment. Bughin (2015) has presented a matrix highlighting the return over the investment in social software, with specific references to ESN.

Although there is still uncertainty about ESN real benefits and outcomes, and the way to measure them when implementing such platforms, the role of these technologies and its patterns of adoption are still under-studied. There is a small understanding how ESNs can be used in organizational in simple work practises (Riemer & Tavakoli, 2013).

This scenario is not restricted to ESNs. Commonly, organizations have difficulties understanding the potentialities of Enterprise Social Software in general. Worries about time wasting, loss of quality control or system abuse make the introduction of ESS to be set aside when it is difficult to assess the

impact of such implementations. Even though, when companies decide to go for implementation, the lack of knowledge about these technologies makes organizations to implement them without clearly defining the strategy and the expected business outcomes, what can also result in lower return on investment (Drakos et al., 2010).

On the other side, difficulties don't remain just on the strategic alignment or on the assessment of the real business value of Enterprise Social Software implementation. There is also a wrong belief that users will automatically start using such technologies with the expected usage patterns right after the roll-out of the technology. Organizations expect employees to have the knowledge to use all the tools and all the information available when necessary (M. Beyerlein et al., 2002).

Innovations are only worth it if they are used in work processes, thus, its benefits shall be explained for them to be adopted by end-users. If that doesn't happen, the expected improvements won't be realized and it is probable for the innovation to be discontinued (Frambach & Schillewaert, 2002). In order to leverage the use of ESN, companies should involve managers and key users from different departments in the process. Linking ESN usage with employees' goals, performance and rewards will empower them to use the technology to accomplish their work related tasks (C. P.-Y. Chin, Evans, Choo, & Tan, 2015). Engaging employees on such platforms largely depend on the level of organizational support and encouragement (Sharma & Bhatnagar, 2016).

The simple act of asking questions is an important precursor of knowledge exchange, but not all the employees feel comfortable to do it in a public visible place. Concerns about other employees' judgement can be an inhibitory factor for some employees (Ellison et al., 2015). It is up to organisation to create a friendly ESN climate for employees to openly share their knowledge (C. P.-Y. Chin et al., 2015). In an open and transparent environment, employees will also feel comfortable to contribute with their positive or negative feedbacks, which allows the identification of areas of improvement in the organization (Sharma & Bhatnagar, 2016). Employees' perception of organizational and supervisor support is also higher when an ESN is available (Vaezi, 2011).

There are different roles among ESN users. Viol, Bernsmann, & Riemer (2015) suggests that user behaviour can be fitted in four categories – contribution & networking, information provision, contact dispersion and invisible usage. Osch, Bulgurcu, & Kane (2016) describes users as core users, super promoters, promoters and periphery users. Following the same logic, Behrendt, Klier, Klier, Richter, & Wiesneth (2015) suggests ESN users' behaviour varies along the hierarchy. If middle hierarchy employees are the ones who use ESNs the most, employees in the lowest positions of the hierarchy almost don't

communicate through ESNs. On the other side, users on the top of the hierarchy exert a top-down communication, which means their messages reach a large number of users in a relatively short time. Interactions are more likely among individuals with small hierarchical distance (Cao et al., 2013).

Large multinational organizations are increasingly dependent on successful knowledge sharing among individuals, teams, and units because of their high degree of geographical dispersion throughout locations and time zones, what has led the adoption of enterprise social network technology (Ellison et al., 2015).

Many Enterprise Social Media projects fail in their first six months because of the lack of employee engagement (Leidner & Tripp, 2016). The acceptance of technology is one of the main reasons for failure of innovative IT. The study of adoption and use of technology has been one of the major research topics in the field of Information Systems (Kugler et al., 2013).

2.4 Innovation process

There are technologies that take a long period to be widely accepted and used even when their benefits are obvious - problem of innovation diffusion. Rogers (1995) characterizes diffusion as a process highly dependent on the innovative technology itself, on the way innovation is communicated, on the social system of the target group and on time.

An innovation should be presented to end-users as a solution to a specific problem or as an improvement to previous practises. The innovation-decision process is made balancing the advantages and disadvantages of using the innovation. In the case of a new technology, the degree to which the new technology is perceived as being better than its predecessor (relative advantage), consistent with present values (consistency), easy to use and to understand (complexity), and to experiment on a limited basis (trialability) as well the degree to which the results are visible (observability), is important to explain different rates of technology adoption (Rogers, 1995). Kapoor et al., (2014) have collected antecedents and descendants of each of these five attributes through a literature review process to get a bigger insight on their effects on the innovation adoption.

Usually, innovation diffusion happens through information exchange between an entity that uses or has experience using the technology and another entity in the opposite situation. Interpersonal channels or mass media channels are important to disseminate the information, however, the first one is more effective forming or changing attitudes towards innovation because it involves a more personal

contact, while the second one is more effective creating knowledge. Opinion leaders are individuals who are able to influence other individuals attitudes, being important for activating the diffusion network (Rogers, 1995). These individuals can assume a leadership position in the adoption process and positively affect it, however, the leadership should stay informal in a way people still feel they can relate with them. When leadership becomes more formal or is enforced, it affects adoption in a negative way (Wisdom, Chor, Hoagwood, & Horwitz, 2014).

Innovation diffusion happens within a social system with specific structures and norms that define the expected behaviour inside the system. The characteristics of the social system and its members, together with the innovation itself and the way it is introduced, influences the time an individual takes to decide to adopt or reject an innovation since he or she firstly heards of it (Rogers, 1995). Diffusion theory can be aplied to identify aspects influencing the adoption process and to understand how do these aspects influence it (Ratcliff & Doshi, 2013).

Frambach & Schillewaert (2002) suggest two stages of adoption: the organizational and the individual one. In an organisational context, the adoption process starts with a decision to pursue adoption at the organizational side. Then, it depends on each individual within the organization to adopt and assimilate the innovation.

2.4.1 Innovation process in organizations

Rogers (1995) suggests a model for the innovation process in organizations, see Figure 2. In the first phase, Initiation, all the information gathering, conceptualization and planning activities for innovation adoption takes place. Implementation phase only starts after the decision to adopt has already been made. In this phase, all the actions needed to put the innovation into practise are performed. These phases are divided in stages that only start after the previous stage to be at least substantially accomplished.

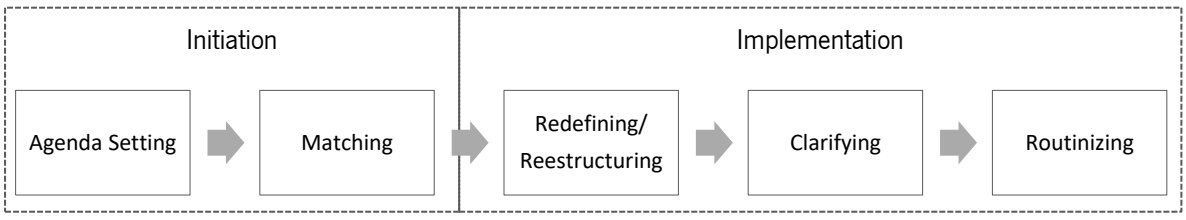


Figure 2: Innovation process in organizations
Adapted from Rogers (1995)

The initiation phase starts with the organisational problem identification and with innovation seeking activities (Agenda setting), then, it is time to understand if the innovation can be a solution to the problem (Matching), leading either to its adoption or rejection (Rogers, 1995).

According to Frambach & Schillewaert (2002), the decision to adopt is influenced by innovation's perceived characteristics, by organization's characteristics and by environmental influences. Innovation's supplier marketing efforts, the social network of the organization and the same environmental influences also seem to influence innovation characteristics perception (Frambach & Schillewaert, 2002). Riemer et al. (2009), in the context of collaboration technologies, describes their adoption as the result of market, organizational and technological trends. In the context of ESNs, Turban, Bolloju & Liang (2011) propose a framework of six steps to evaluate the usefulness of the technology:

1. Determine the fit between social networking technology and the target tasks;
2. Analyse the technology's economic viability;
3. Identify the necessary IT infrastructure;
4. Examine the human and organizational factors associated with the application;
5. Choose a deployment strategy;
6. Measure performance.

A better understanding of the adoption processes makes the adoption challenges more easily addressable (Wisdom et al., 2014), leading to a smoother implementation phase. In this phase, the innovation firstly needs to be customized in order to fit organisational needs, however it might happen that the organization also needs to adapt to the innovation (Redefining/restructuring) (Rogers, 1995).

Organization leaders may do preparatory work in the organization before the introduction of an innovation in terms of culture or attitudes (Wisdom et al., 2014). Then, the changes need to be clearly explained to the users to avoid misunderstandings and corrective actions should be addressed to deal with unwanted consequences of the adoption (Clarifying). According to Maruping & Magni (2015), interventions to promote technology exploration should be directed to teams rather to individuals, letting teams manage the process. When team members collectively experience a technology, they are less likely to resist using or incorporating it in their work routines, and they will embrace it in an easier way. The process ends when innovation is embodied in organization's structure and incorporated in routine activities (Routinizing) (Rogers, 1995).

The innovation process, as described in this section, can be seen as a complex set of actions undertaken by the organization with the objective to implement an innovation. Therefore, it makes sense to look to these initiatives through the optic of project management as a project "is a temporary endeavour undertaken to create a unique product, service, or result". The PMBOK Guide highlights five groups of project management processes that are inherent to the life cycle of a project (Project Management Institute, 2013):

- Initiating Process Group: processes performed to define or authorize a new project, to define project scope, purpose, and financial resources, to identify stakeholders and ensure alignment between projects goals and their needs;
- Planning Process Group: processes required to assess the effort of the project, define objectives, and determine the set of activities to accomplish those objectives. Project plan is a deliverable of this group of processes;
- Executing Process Group: processes performed to complete the activities defined in the project plan;
- Monitoring and Controlling Process Group. processes required to track and assess the progress and performance of the project;
- Closing Process Group. processes needed to finalize all activities across all Process Groups to formally close the project or phase.

However, these groups of processes are just guides for applying appropriate project management knowledge and skills during the project. On other words, project management should handle initiation, planning, executing, monitoring and controlling and closing aspects of a project (Project Management Institute, 2013).

Innovation assimilation seems to be better in larger, more mature, functionally differentiated and specialized organizations (Greenhalgh, Robert, Macfarlane, Bate, & Kyriakidou, 2004).

2.4.2 Innovation process in individuals

There are different types of innovation-decisions. If in some cases the decision depends only on individual's side, in other cases, adoption decision is a consensus among the members of the system, or is just imposed by members with higher level of authority. In organizational context, the individual innovation-decision only can be made after the organizational adoption of the technology (Rogers, 1995). Greenhalgh et al. (2004) highlight the complexity of the adoption, describing it as a process in which each phase has concerns that should be addressed. Rogers (1995), proposes a five phases process for the individual decision to adopt an innovation, see Figure 3.

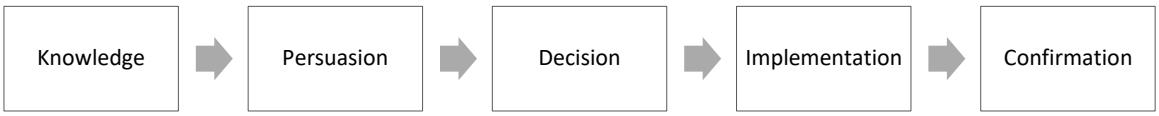


Figure 3: Model of stages for individual innovation-decision process
Adapted from Rogers (1995)

According to Rogers (1995), in the first phase, the individual is exposed to the innovation and seeks information to understand if it is useful to solve a problem or a current need. In persuasion phase, the individual forms a favourable or unfavourable attitude towards the innovation, however that doesn't mean the innovation will be rejected or adopted right away. Usually, individuals look for reinforcement of their ideas among their peers and, in decision phase, the decision to adopt or reject the innovation is effectively made, being stated that individuals who had the opportunity to try the innovation are more likely to decide to adopt it if advantages were perceived. In fact, if the individual doesn't obtain enough information about how to use the innovation or if the advantages are not perceived as substantial, it is highly probable for rejection to happen. Thus, an innovation should be presented as a superior alternative to a previous practice, as an answer to a perceived need or problem, in such a way potential adopters will take some effort to learn about the innovation or even to try it. For Frambach & Schillewaert (2002), individuals' decision to adopt an innovation is influenced by a set of factors included in categories such as social usage, attitude towards using the innovation, personal dispositional innovativeness, organizational facilitators, and personal characteristics, see Figure 4.

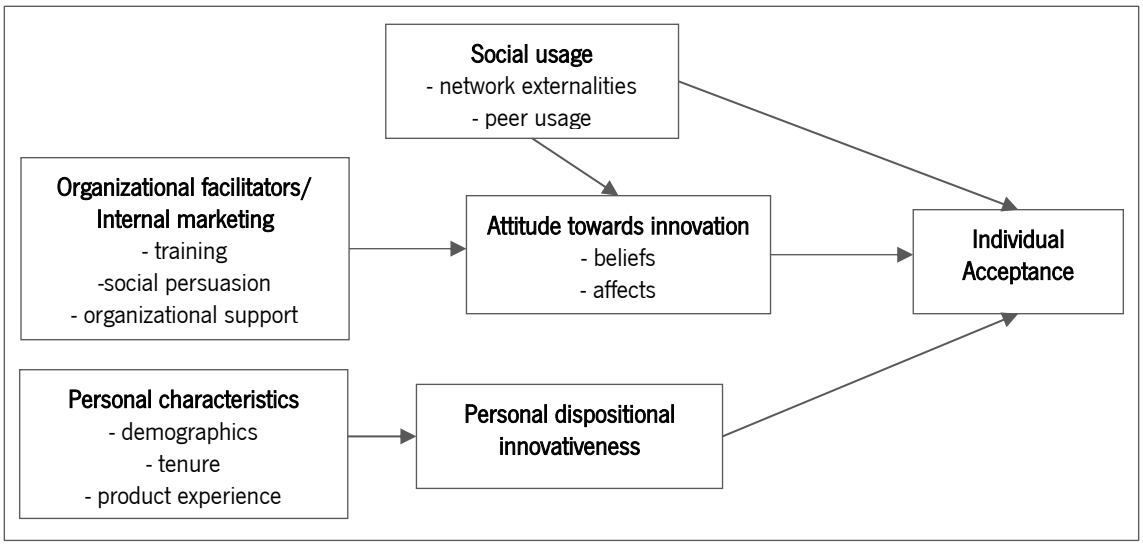


Figure 4: A model for individual innovation acceptance
Adapted from Frambach & Schillewaert, (2002)

If in the first three phases, innovation is assessed mentally, in the implementation phase, innovation starts to be used. The implementation phase only ends when the innovation is embodied in adopters' operations. At last, confirmation phase is described as a reinforcement or reversion of the decision previously made. An individual who was using the innovation may decide for discontinuance, e.g., due to dissatisfaction or because a more recent innovation is supplanting the previous one. On the other hand, individuals who have decided for rejection, may now change their minds, and decide to adopt the innovation (Rogers, 1995).

Everyone takes a different time to adopt an innovation. The degree of innovativeness, i.e., "the degree to which an individual or other unit of adoption is relatively earlier in adopting new ideas than other members of a system", was used to categorize individuals as innovators, early adopters, early majority, late majority and lagards (Rogers, 1995). However, there is some criticism to this categorization of individuals both because it is too reductionist and it lacks an empirical support (Greenhalgh et al., 2004).

Adoption shouldn't be treated alone, but having in mind the implementation phase. However, it is important to identify modifiable factors to design approaches to improve adoption, even more if a successful adoption is a good indicator of a successful implementation (Wisdom et al., 2014). There is a tradition of individual technology acceptance models in the Information Systems literature which makes it one of the most mature streams in IS (Bullinger, Renken, & Moeslein, 2011; Frambach & Schillewaert, 2002; Venkatesh et al., 2003). The benefit of such maturity is the availability of frameworks and models that can be applied to study specific problems (Dennis et al., 2003).

2.5 Technology acceptance and use models

2.5.1 Unified Theory of Acceptance and Use of Technology

The Unified Theory of Acceptance and Use of Technology (UTAUT) was developed as an effort to unify the findings reached over the years in the research field of information technology acceptance. UTAUT is a unified theory, likewise it integrates elements from eight previous major theories and models in the field: Theory of Reasoned Action, Technology Acceptance Model (TAM), Motivational Model, Theory of Planned Behaviour, Model Combining Technology Acceptance Model and Theory of Planned Behaviour, Model of PC Utilization, Innovation Diffusion Theory and Social Cognitive Theory. Being one of the main objectives of UTAUT to explain technology usage, all previous mentioned models have intention or/and usage as their key dependent variables (Venkatesh et al., 2003).

UTAUT was formulated using conceptual and empirical similarities found among the eight models and was tested and validated in organizational contexts. The proposed model, see Figure 5, explains 70% on the variance on users' intentions to use information technology (Venkatesh et al., 2003).

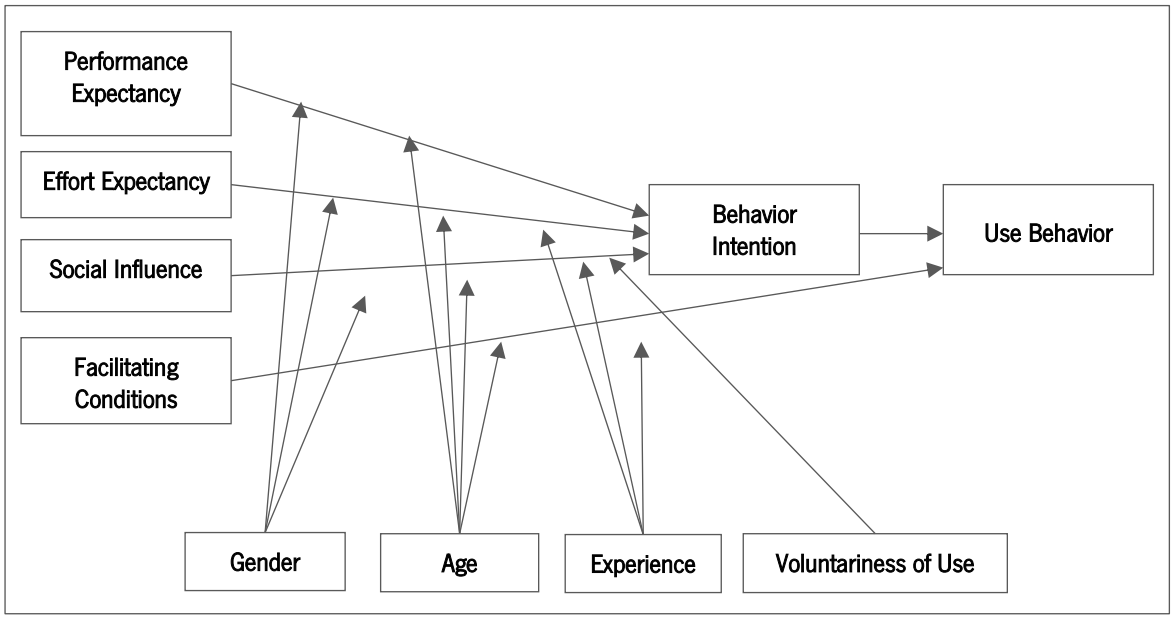


Figure 5: Unified Theory of Acceptance and Use of Technology model
Adapted from Venkatesh et al. (2003)

The model proposed by Venkatesh et al. (2003) suggests four determinants of Behaviour Intention and Use Behaviour:

- Performance Expectancy: “the degree to which and individual believes that using the system will help him or her to attain gains in job performance”;
- Effort Expectancy: “the degree of ease associated with the use of the system”;
- Social Influence: “the degree to which an individual perceives that important others believe he or she should use the system”;
- Facilitating Conditions: “the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system”.

Gender, Age, Experience and Voluntariness of Use are key moderators of the previous determinants (Venkatesh et al., 2003).

2.5.2 Adoption and Use of Collaboration Technology

UTAUT lacks in explaining situational characteristics influencing the adoption and use of technology. This way, UTAUT doesn’t directly explains adoption and use of collaboration technology. The model Adoption and Use of Collaboration Technology (AUCT) was developed having UTAUT as mediator between the situational characteristics and the ultimate adoption and use of technology. Situational characteristics constructs were based in Social Presence Theory, Channel Expansion Theory and Task Closure Model (Brown et al., 2010).

This model proposes five categories of factors influencing UTAUT determinants, which then influence intention to use technology and the use of CT. These five categories are technology characteristics, individual and group characteristics, task characteristics, situational characteristics: co-workers and situational characteristics: environment, see Figure 6 (Brown et al., 2010).

The model was first tested among 249 users of SMS technology in Finland. The second study was conducted in a Fortune 500 technology company, also in Finland, and encompassed the conduction of two questionnaires. The first questionnaire was conducted among 830 employees during the implementation process of a new collaboration technology to collect data about intentions and expectations in using that technology. The second was conducted after six months to collect data about technology use. 447 of the previous employees participated in the second questionnaire. The results supported the model suggested, being UTAUT determinants mediators of the effect of collaboration-related constructs in intention to use technology (Brown et al., 2010).

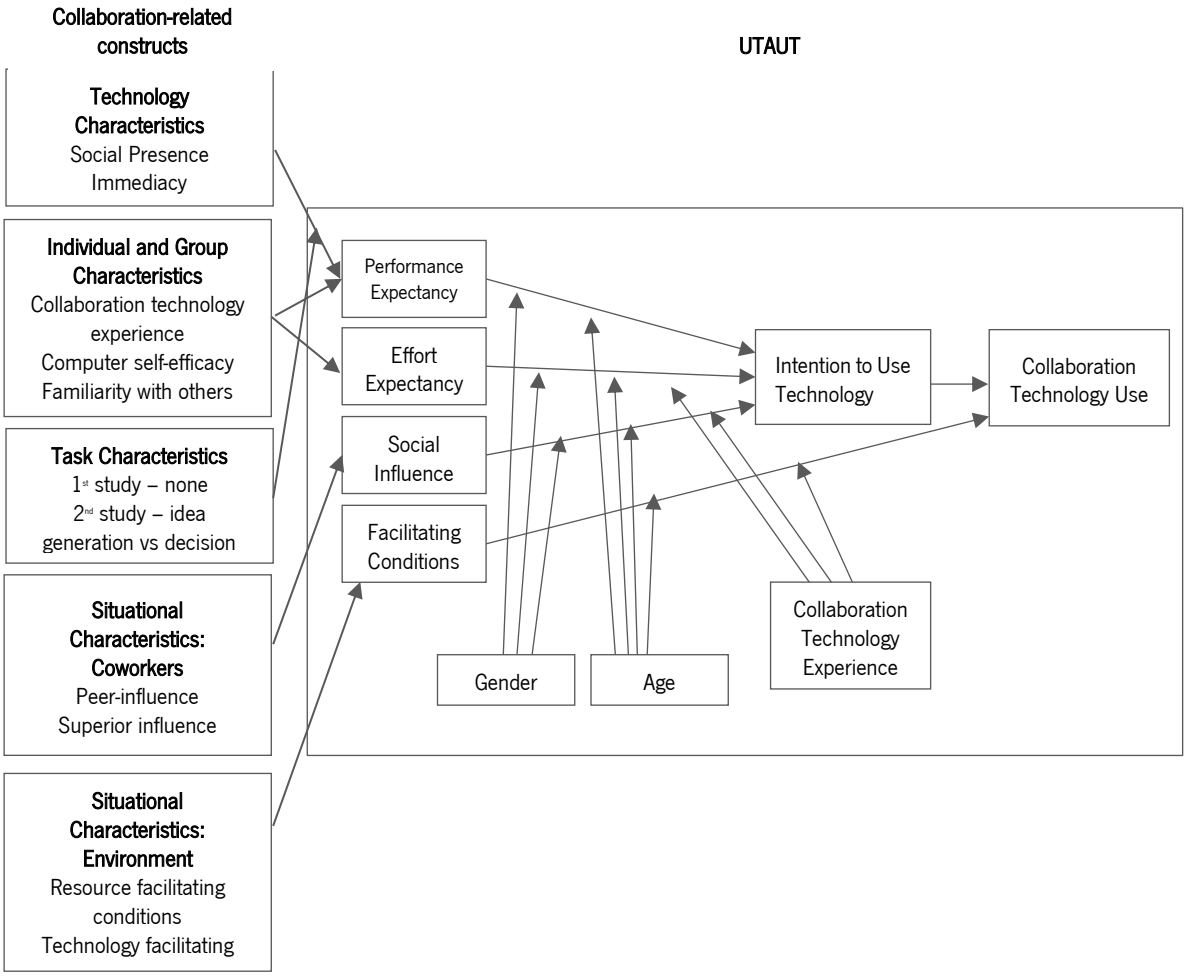


Figure 6: Adoption and Use of Collaboration Technology model
Adapted from Brown et al. (2010)

Years before, Dennis et al. (2003) had already formulated a model of acceptance of collaboration technologies, but integrating TAM and CT constructs. Technology Acceptance Model has been applied to a wide range of technologies along the years to predict individual acceptance and use, however it also didn't provide explanations that could be used to implement initiatives to foster acceptance, which was also stated about UTAUT (Brown et al., 2010). This model was tested in Finland, among 349 short message service (SMS) users, and builds on Social Presence Theory, Task Closure Model and Media Richness Theory constructs to predict general collaboration technology use - first two theories were also used for AUCT. In this model, the following TAM constructs: attitude toward using technology, perceived usefulness and perceived ease-of-use are influenced by technology characteristics (social presence, media richness, immediacy, concurrency), individual and group characteristics (gender, age, self-efficacy, typing speed, technology expertise and familiarity with others) and task characteristics (mobility), which were derived from the theories presented before (Dennis et al., 2003).

2.6 Related Research

From the literature review it was possible to identify research initiatives that use UTAUT and AUCT model for explaining technology usage in different contexts.

Im, Hong, & Kang (2011) studied the influence of culture on UTAUT constructs to find that technology adoption is a cultural process as much as a rational decision-making process. A study conducted in the context of the adoption of MP3 technology and Internet banking in South Korea and USA, among 501 students and workers, concluded that effort expectancy is more determinant for behaviour intention in USA than in South Korea. US users are more impacted by easy-to-use technology, being more probable for them to use technology if they have the intention to do it. Raman, Sani, & Kaur (2014) in a study conducted among 149 students in high schools in Malaysia, based on UTAUT constructs, concluded that Social Influence and Facilitating Conditions have a positive influence in the intention to use Facebook as a collaborative and communication tool.

Focusing in social research network sites(SRNS), Bullinger & Renken (2011) identified a gap in the research field of online collaboration technologies adoption. Thus, he formulated a model built on UTAUT (Venkatesh et al., 2003), AUCT, (Brown et al., 2010) and in user resistance theory to investigate acceptance of online collaboration technology, more specifically, SRNS. The proposed model suggests Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions – from UTAUT - and User Resistance, i.e., the opposition to change associated with a new online CT, as determinant factors of the intention to use online CT. On the other hand, Perceived Value (benefits and costs from switching technologies), Communication Benefits and Noise (i.e., the confusion that the existence of several overlapping software technologies provoke to users), Individual and Group Characteristics (computer self-efficacy, online technology experience and privacy), Situational Characteristics of co-workers (influence of peers and influence of supervisors), Situational Characteristics of environment (resource facilitating conditions and technology conditions) influence User Resistance, Performance Expectancy , Effort Expectancy, Social Influence and Facilitating Conditions respectively. However, the model wasn't widely tested and validated.

2.6.1 Organisational adoption and introduction processes of ESS and ESN

In the literature there are contributions about organizational decision to adopt ESS and ESNs and the consequent implementation processes. Table 3 presents the contextual description, findings and the source of each of these initiatives.

Table 3: Research about ESN and ESS in organisations

Contextual description	Findings	Source
Theoretical research	Seven dimensions of issues and considerations when deciding to adopt and ESN: • Purpose; • Target participants; • Technology selection; • Anticipated risks; • Risk management mechanism.	Turban et al. (2011)
Yammer implementation in three large companies	Implementation description and recommendations: • Bottom-up approach; • Development of code of conduct; • Support of low and middle-management (facilitators); • Support of top-management (encouraging usage); • Users should adopt the technology on their own and according to their needs; • Managers can interfere by setting the right context for usage; • The will of future participants to interact with their colleagues in discussions and opinion sharing triggers adoption.	Richter et al. (2013)
ESN implementation in large company in Russia – 20 000 employees across nine time zones	Success factors: • Top management participation, commenting and liking other employee's posts; • ESN introduction was part of a wider cultural change in the company and it appeared to fulfil a specific need; • Employees' technological background and early age are also perceived as facilitators.	Gibbs et al. (2015)
Intranet implementation in world leading energetic company in Norway	Learnings: • Managers should have been more patient when waiting for user generated content in the platform; • Top management should look less conservative by showing participation and contribution in the intranet;	Han, Sörås, & Schjodt-osmo (2015)

Contextual description	Findings	Source
	• Collaboration culture should be changed incrementally; • Content and information management should be a priority.	
ESN implementation at Atos – 76 000 employees across 66 countries	Barriers: • Cultural change (Atos is present in 66 countries), • Management support (middle low management support is important for ESN success), • Technology adoption; • Education/ training for employees to deal with the new reality.	Silic, Back, & Silic (2015)
Wikis implementation study in 1 000 German small-medium enterprises	Recommendations for higher levels of diffusion: • Top management support; • Definition of goals; • Rewarding employee's participation; • Wikis high level of quality; • Existence of lead users.	Stieglitz & Dang-Xuan (2011)
Yammer implementation at Capgemini, a globally operating consultancy business	Implementation description: • The adoption process occurred naturally among users but it proliferated when the corporate annual report listed Yammer in knowledge section as a tool to improve communication and collaboration.	Riemer, Diederich, Richter, & Scifleet (2011)
ESS implementation in six medium/small companies	Implementation approaches: • Predominance of top-down approaches; Motivating factors: • Content related motivation (relevance, significant content, high quality, topicality); • Availability of new ways of information dissemination; • Increase of efficiency in daily work. Success factors: • Support from management; • Technical support for users.	Zeiller & Schauer (2011)
Yammer introduction in a community of 31 students	Findings: • Users tend to adapt applications as Yammer to suit their own needs; • Community promotor tends to transition towards a facilitating role; • After users start to engage in the platform, it becomes increasingly self-sustaining.	Murphy (2016)

2.6.2 Individuals' adoption and use of ESS and ESN

Riemer & Scifleet (2012) propose four distinct phases of Yammer acceptance by individuals, drawing on the analysis of Yammer posts' content at Capgemini, an international service consultancy company, see Figure 7. In the first phase - Encounter - Yammer is analysed and compared to other technologies. In second phase - Sleeping - Yammer is negatively reviewed and users question its usefulness. In third phase - Make or Break - interest grows, some positive examples of Yammer incorporation in work practises are shared and diffusion starts to be actively promoted. In fourth phase - Uptake -, shared norms emerge and people see new users joining the platform.

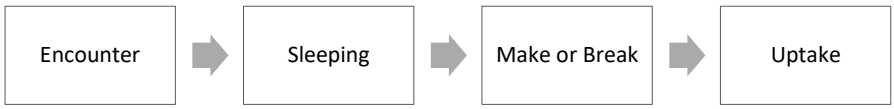


Figure 7: Yammer acceptance process by individuals
Adapted from Riemer & Scifleet (2012)

There are also studies related to the categorization of ESN user roles (Berger, Klier, Klier, & Richter, 2014; Hacker et al., 2017; Osch et al., 2016; Viol et al., 2015) and to the analysis of user behaviours: a study in a company with 79 000 employees using Jive software, an ESN, found out that employees tend to relate more with other employees from the same hierarchy level and same country (Cao et al., 2013). In the literature it is also possible to find models explaining ESS and ESN adoption and usage. The main research initiatives found are identified in Table 4. For each research initiative, a brief description is presented, as well a summary of its methodology and findings.

Table 4: Models for ESS and ESN adoption and use

Research description	Methodology	Results	Source
Factors influencing employees' ESS usage	Literature review	Model for ESS adoption. ESS adoption depends on technological factors (relative advantage, ease of use, result demonstrability, compatibility), social factors (reputation and perceived critical mass), organizational climate (trust, collaboration norms, community ties), moderate by private social software experience.	Kügler et al. (2013)
Factors influencing the adoption of ESS	Online survey and Structural Equation Modelling to analyse results.	Model for ESS adoption. Perceived usefulness and perceived ease of use influence ESS adoption. Perceived ease of use and perceived usefulness are influenced by	Antonius, Xu, & Gao (2015)

Research description	Methodology	Results	Source
		individual factors, organizational factors, task complexity, organizational culture, and knowledge strategy	
ESN usage for impression management tactics by academics	Literature review Case study: Interviews and future survey to validate the model	Model for ESN usage. Impression management tactics (self-promotion, ingratiation, exemplification, intimidation, supplication) and motivational factors (post quality and posting self-efficacy) influence ESN usage	Ortbach & Recker (2014)
Influence of organizational climate in Enterprise Social Software Platforms (ESSP) usage	Exploratory study to collect perceptions about ESSP. Survey research (item creation, validation questionnaire and questionnaire)	Trust, collaboration norms and community identification influence consumptive and contributive use of ESSP. Organizational climate influences ESSP consumptive and contributive usage. Collaboration norms have a stronger impact on consumptive ESSP usage. Employees consume content only if they trust their peers and if they feel this activity conforms with collaboration norms.	Kügler, Lübbert, & Smolnik (2015)
Motivation factors behind behaviours in ESN	Literature review Case study: Survey	Model for ESN behaviour. ESN behaviour depends on perceived attitudes (playfulness and usefulness) and motivational factors (self-disclosure, sharing, social identification, incentives)	Xiong et al. (2014)
User behaviours in ESS	Qualitative and survey based	Model for ESS usage behaviour. People use ESS for consumptive, contributive, hedonic or social purposes.	Kügler & Smolnik (2014)
User resistance behaviour to ESN	Survey research to 253 workers from several sectors and different experiences with ESN. Regression analysis for data analysis	Model for intention to use ESN. Intention to use ESN depends on privacy concerns, perceived usefulness, and perceived ease of use. Privacy concerns negatively influences perceived ease of use and perceived usefulness.	Buettner (2015)
Factors influencing ESN use	Six interviews with six employees picked randomly	ESN use behaviour tends to be influenced by socio-technical factors, including technological (i.e. platform and content quality), organizational (i.e. top management support and ESN facilitating conditions), social (i.e. critical mass and communication climate), individual (i.e. perceived benefits, knowledge self-efficacy and time commitment) and task (i.e. task characteristics) factors	C. P.-Y. Chin et al. (2015)

2.7 Discussion

From this literature review, it is possible to understand that when it comes to the study of innovation diffusion, Rogers (1995) presents an extensive description about the process either at the organizational level as at the individual level. However, these processes are not independent. Individual adoption of an innovation is intimately related to the environment surrounding the individual. In an organizational context, the way the innovation, or the technology, is presented and introduced to the individual will massively influence the individual decision to adopt and to use it.

Venkatesh et al. (2003) and Brown et al. (2010) present models that express this same idea. UTAUT enhances performance, effort, social and facilitating aspects as determinants of intention to adopt and, consequently, use technology. AUCT builds on UTAUT to highlight a set of situational constructs that affect this same adoption process in the context of collaboration technology.

In the field of Enterprise Social Software and Enterprise Social Networks, there are models and research initiatives focusing in the adoption, use and perceived benefits of such technologies. However, the majority of these studies focuses in the broad category Enterprise Social Software - e.g. Kügler et al. (2013) and Antonius et al. (2015). Nonetheless, it was possible to identify four studies that address the adoption/use of Enterprise Social Networks. Ortbach & Recker (2014) studied ESN use for impression management in academia context and Buettner (2015) studied ESN usage with a focus on privacy concerns. Xiong et al.(2014) studied factor influencing user behaviour and C. P. Chin & Choo (2015) highlight a set of factors that influence ESN usage in the context of a case study. Other studies concentrate on ESNs benefits - e.g. Mäntymäki & Riemer (2014) and Boughzala (2014).

Following this line of thought, there are research studies describing the assessment process to adopt ESN - e.g. Turban et al. (2011) - as well its implementation process - e.g. Gibbs et al. (2015). Richter et al. (2013), Riemer et al. (2011) and Murphy (2016) present findings related to Yammer implementation process in different contexts.

Even though these studies are good examples of related studies and they provide useful information for this research study, none of them directly relates the adoption and introduction process of ESNs, at organizational level, with individual use of ESNs. Therefore, to focus efforts in this topic seems to be a good research opportunity as findings will potentially be useful for the state of the art of ESN and the organizational problem, identified in section 1.1.1, will also be addressed.

3. PART I: HOW WAS YAMMER ADOPTED AND INTRODUCED AT LSA?

This chapter provides a description of the adoption and introduction process of Yammer at LSA and pursuits the goal of answering the sub-research question "How was Yammer adopted and introduced at LSA?".

3.1 Methodology

Part I of this master dissertation intends to answer the sub research question "How was Yammer adopted and introduced at LSA?" following a case study research method. Table 5 summarizes the research methodology followed in this section. Sections 3.1.1, 3.1.2 and 3.1.3 provide detailed information into the research, data collection and data analysis methods applied.

Table 5: Part I methodological overview

Research approach	Qualitative
Philosophical overview	Pragmatic Worldview
Research design	Qualitative
Strategy of inquiry	Qualitative
Research methods	Case Study
Data collection methods	Document analysis Semi-structured interviews Analytics analysis
Data analysis methods	Content analysis

3.1.1 Research method

Phase 1 will be based in a case study research method. Yin (2009) describes case study research as a "linear but iterative process" of six phases:

- Plan: Identify research questions or other logic basis to perform the case study and define case study method;
- Design: Define unit of analysis, develop theories, propositions, identify anticipated issues, identify case study design, and define quality control mechanisms;
- Prepare: Training for the specific case study through conduction of pilot cases, polish investigator skills and develop case study protocol;

- Collect: Data collection can be undertaken using different data sources and following different principles of collection;
- Analyse: Data analysis following data analysis procedures and techniques;
- Share: Elaboration of case study report.

Even though a case study research was followed, these guidelines were not strictly applied. In this case, the research question was already previously defined, however interview questions were developed specifically for each interviewer in order to clarify some anticipated issues that arose from the investigator interaction with the organization and from the literature. The unit of analysis was the adoption and introduction process of Yammer in the organization and quality was mainly ensured by comparing evidences from multiples sources of information – Plan, Design and Prepare. Data collection and data analysis methods are further developed in section 3.1.3 and 3.1.3 – Collect and Analyse. Section 3.1.3 presents case study findings – Share.

3.1.2 Data collection methods

Because using multiple sources of evidence leads to enhanced validity and reduced bias (Eisenhardt & Graebner, 2007) and increases probability of case study findings to be more convincing (Yin, 2009), data will be collected through semi-structured interviews to people involved in the project, analysis of document related with Yammer adoption and introduction project and analysis of Yammer performance analytics.

3.1.2.1 Interviews

The most valuable information used to describe and analyse the introduction process of Yammer came from the conducted interviews.

a) Interviewees

Six individuals involved in Yammer's introduction process at LSA were interviewed to clearly understand how the process was undertaken. INT-15 and INT-13 were the project leaders of the first and second Yammer introduction initiatives, respectively. INT-14 took part in both projects as a team member. INT-16, Head of Workplace & Application Services, provides a top-management overview of the process.

INT-17 worked along INT-15 during the pilot phase by being the local responsible for one of the pilots. INT-18 is the current owner of the tool.

The interviews to INT-13, INT-14, INT-16 and INT-18 were conducted face-to-face in a meeting room. The interviews to INT-15 and INT-17 were conducted by Skype due to the geographic distance of the interviewees. All the interviews were recorded using either Skype for Business Recording Manager (when conducted by Skype) either Windows Voice Record (when conducted fce-to-face). Then, all the interviews were transcribed using oTranscribe, a freemium web application suited for the task. See Table 6 for more details about the interviewees.

Table 6: List of interviewees

Interviewee ID	Gender	Function	Location
INT-13	Male	IT Project Manager	Headquarters
INT-14	Female	IT Project Manager	Headquarters
INT-15	Female	IT Project Manger	United States of America
INT-16	Male	Head of Workplace & Application Services	Headquarters
INT-17	Female	Marketing and Communication	Portugal
INT-18	Male	Head of Workplace Platform Services	Headquarters

b) Interview questions

The interview questions varied depending on the interviewee because all of them had different roles and were involved in different stages of Yammer introduction process. INT-13, INT-14 and INT-15 were asked about the reasons why Yammer was introduced at LSA, who was involved in the decision, the main concerns when introducing such platform and specific activities executed during the process. They were also asked about benefits assessment, best approaches and learnings and failures.

INT-16 was mainly asked about the strategic objectives behind Yammer introduction, the decision-making process, as well the main differences between the two projects. INT-17 was contacted to understand how the process of implementing the pilot group MO Portugal was conducted. INT-18 was interviewed to understand the current Yammer status and understand what is the strategy for the coming years.

3.1.2.2 Documents

Table 7 presents all the documents used as a source of valuable information to describe Yammer adoption and introduction process.

Table 7: List of consulted documents

Document ID	Title	Date	Description
DOC-1	Yammer presentation All Team Meeting	30/09/2014	Presentation explaining Yammer strategy and status
DOC-2	Yammer and IT Support	22/05/2014	Explanation of the use cases of the IT pilot
DOC-3	Yammer Pilot Social Network Governance	08/10/2014	Set of explanations and Yammer good practices
DOC-4	Yammer Project Plan with Change Management	18/02/2015	Project plan to implement Yammer at LSA
DOC-5	Yammer Enterprise Social Media G1	20/02/2015	Official proposal to implement Yammer at LSA
DOC-6	Yammer Pilots Learnings	26/02/2015	Description about Yammer pilot learnings
DOC-7	Support and product champions concept for Yammer	13/07/2015	Document explaining the support and product champions concept
DOC-8	Yammer Foundation and Launch	04/08/2015	Explanation of the Launch concept
DOC-9	Work Smarter	11/06/2014	Explanation of Work Smarter concept
DOC-10	Yammer Presentation	24/09/2014	Introduction to Yammer
DOC-11	December engagement	25/02/2015	Print screen of the analytics of the week comprised between 11th and 18th December 2014

3.1.2.3 Yammer Analytics

The evolution of the Yammer network was assessed through usage indicators as “total number of users” or “number of engaged users”. Those indicators were made available by Tryane Yammer Analytics, the analytics tool used in the organization to track the health of the network. This information was collected by direct observation of the dashboard and analysis of data exported from the same dashboard.

3.1.3 Data analysis methods

Collected data will be analysed applying content analysis methods that provide a set of analytical technics to make replicable and valid inferences from texts (White & Marsh, 2006).

3.2 Findings

3.2.1 Decision to adopt Yammer at LSA

In this company, it was possible to understand that the organizational global strategy unfolds into different topics that are then addressed by the strategies of the different departments. On IT side, the incorporation of the organizational strategic directives has resulted in three core IT strategic elements: "How we work", "What we offer our customer" and "How we interact with our customer". Yammer had a good fit for the strategic dimension "How we work" and was a great add-on for a "to-be" connected and information-enabled company due to social networks power in connecting people and exchanging information: *"...we need a social network, (...) we need to bring in together our global community spread over more than 120 countries with all their ideas to find the innovations, but later on, also to sell them. So that we will really get this decentralized power, brain power, together. (...) Yammer was the vehicle to do that, to connect the people better, (...) So that we increase the innovation selling effectiveness, increase our customer relationship and also increase productivity of the users with Yammer.*" (INT-16).

Yammer was introduced in the company by upper management decision along with the team responsible for the workplace collaboration technologies and Microsoft. There was a vision to create a worldwide connected organization with increased communication and collaboration capabilities. Yammer was the tool that would facilitate innovation development and enable organizational growth. "*And that's the ultimate goal: to create the business value so that people don't have to work twice, or three times or four times. Really creating global innovation and collaboration, so that the company grows its business.*" (INT-15).

Having Yammer on Microsoft roadmap seemed to be the right opportunity to introduce an internal social network in the company. Microsoft released Yammer as an integrated part of Office 365, which means it was provided as an add-on to the software package the company had already implemented in the company. Therefore, the company didn't get any direct extra costs and the tool support was also ensured. According to INT-16, *"...the decision process to select Yammer was straight*

forward because it was simply already granted and we had very good usage reports from Microsoft, very good reports from them, how they are using it, and that was a compelling story (...) we could straight ahead make the most out of that".

3.2.2 Introduction of Yammer at LSA

Even though Yammer had a great fit on the organizational strategy and it was easily made available on the supplier side, the process to introduce the platform to the users wasn't so straight forward. Indeed, Yammer was introduced through two distinct project initiatives. At first, there was the need to understand how the platform would be used in the company, integrated in the work routines. This approach was mainly focused in setting up all the technical infrastructure to prepare the platform to receive the users, conducting pilots and creating an engaged base of users. Then, Yammer was officially launched to the entire company through the conduction of a series of communication and marketing initiatives. In INT-16 eyes, "*[INT-15, the project leader of the first project] putted a lot of technology in the middle to get it going, which probably was also even needed, but [INT-13, the project leader of the second project] from day one, implemented already strong user focus, and that was good."*

3.2.2.1 First Project: Introduction, Technical Set-up and Pilots

INT-15, the project manager of this first initiative, states that the main goal of the project was to promote social collaboration within the company, drive innovation and create business value by breaking down the organizational silos people were still working in. The level of engagement, the number of new users and the number of active groups, on daily and weekly basis, were some of the indicators used to measure the progress of the project. "*Microsoft would always tell us that in the house of forties to fifties, if you have fifty or over engagement, that you are doing really well with your users. We looked anywhere that 30-50% range of engagement as being very good. So, we definitely did analytics and looked at them weekly and provided the status report for our management.*" (INT-15). INT-16 adds "the first big target was getting users on, getting them registered, and they, actively, started to use it". These statements are corroborated by several existing documents where is possible to visualize some of these analyses. DOC-1, dated from 30/09/2014, also expresses that *"The primary purpose is to drive adoption rate and increase engagement".*

Figure 8 represents a high-level representation of the project plan. In the diagram, it is possible to visualize the four major phases in which the project was divided and the milestones over time.

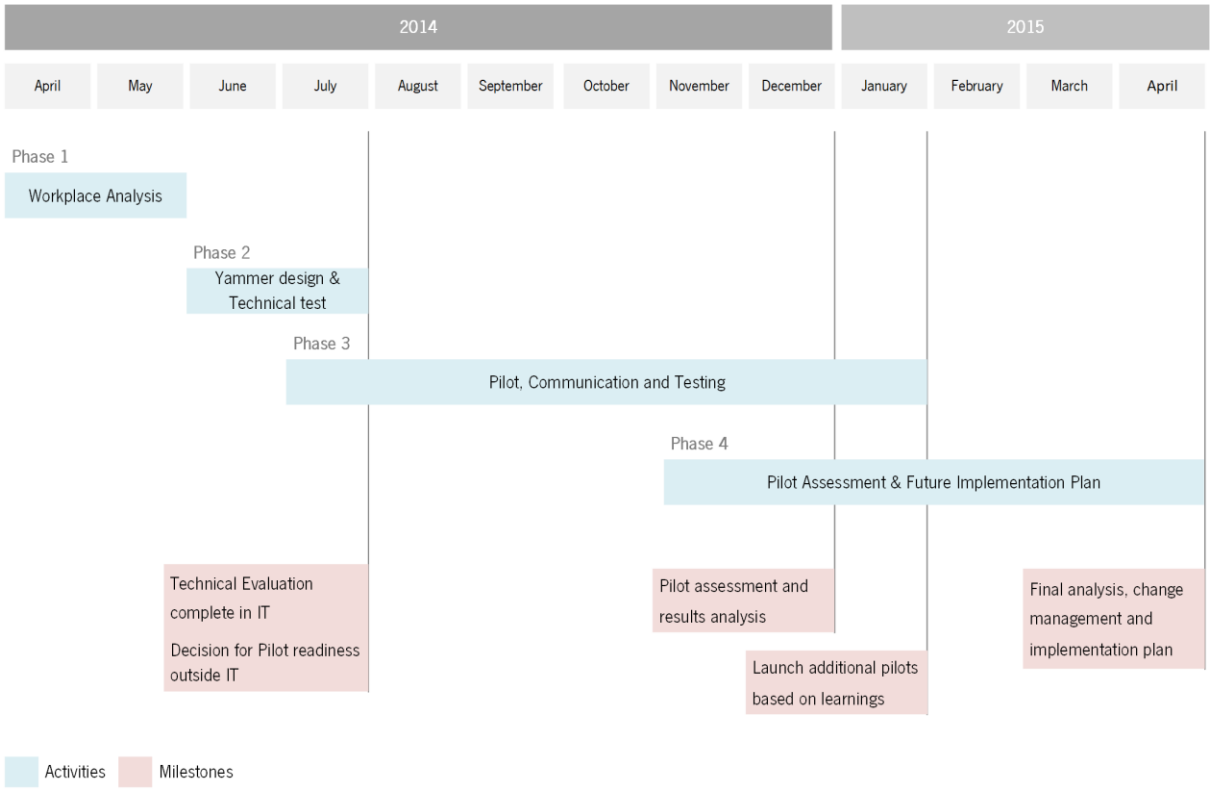


Figure 8: Project plan from the first project.

a) Phase 1: Workplace Analysis

During Phase 1, the project team worked together with Microsoft and their Yammer implementer, who had experience implementing Yammer in other companies. By analysing other companies' learnings and failures, the intention was to understand how Yammer could fit in LSA and be used by employees in alignment with the organizational strategy.

b) Phase 2: Yammer Design & Technical Test

In Phase 2, a set of technical set ups took place and the first pilot, the pilot in IT, also started. IT department is a global department as it is divided in three locations. Yammer would be a good tool to work as a knowledge base inside the department because all IT engineers would be able to access the same source of information, independently of the location where they were working. DOC-2, dated by 22/05/2014, highlights three main goals of this first pilot group: to post information about issues and

support requests received from users; to post information about issues found on systems that may originate support requests on users' side and promote discussion inside IT to provide solid solutions and services to users.

Nevertheless, IT people didn't use it as expected on INT-15 eyes: "*we put IT onsite support together, we were hoping that they would really use it [Yammer] to collaborate. And that was kind of the odd thing is that, instead of using Yammer, they would still yell across to each other: Hey, did you solve this problem? And instead of posting it and using it as a knowledge base, it was kind of hard to get that group to use it as we thought it should be used.".* In the end, remained the idea that "*they have to come up with their own innovations, our perception of innovation is not always how it works.".*

c) Phase 3: Pilot, Communication and Testing

During Phase 3, the pilot groups were extended to outside of IT because "*IT's way of usage of Yammer is totally different from the [market] organizations' usage*" (INT-15). The pilot groups would be important to "*develop use cases because sometimes, like I said, it is organic how things evolve, things we never even think of.*" (INT-15). There was a common sense that "*Creating innovation (...) or creating social collaboration within in our sales organizations [MOs] would create definitive business value*" (INT-15). Hence, a pilot was created in one of the market organizations in the United States of America.

The other pilot groups, MO Portugal and Diversity & Inclusion groups "*were chosen just because some of them started using it [Yammer], it kind of went viral there for a little bit, where people just started using it on their own. Well, that was when, as I was talking earlier, you find your enthusiastic users, they came up very quickly. So, MO Portugal was one of those that was trying to use it without any guidance or framework and, then, the Diversity & Inclusion (...) was one of the biggest organizational targets.*" (INT-15).

INT-17 was the person responsible for the Portuguese MO Yammer group. She confirms that the group was "*as initiative on our side. We had some problems conciliating information and it was also a way to improve the interaction inside the team*". The group was created in August 2014. In September, INT-17 was contacted by INT-15. "*It was when she [INT-15] explained me I shouldn't have created the group because they were still in a pilot phase, but once the group was already created and because we were an organization different from the other pilot organizations, she [INT-15] told us that we could keep*

the group but also as a pilot". INT-17 was given freedom from INT-15 side as she understood MO Portugal needs and she didn't know the organization. That way, INT-17 would be the one trying to understand what could be done to pull Yammer up, "off course with common sense (...) There were some ethical rules we discussed because it was still a work place, so we needed to keep it professional" (INT-17). After that meeting, there were some sporadic meetings between INT-17 and INT-15 to share what had been done and how it was going.

Even though DOC-3, a documented made available in Yammer, and dated by 8/10/2014, clearly expressed users shouldn't create new groups because the idea was just to conduct the specified pilots, different groups started to appear. INT-15 says "*social platform was not created to be locked down in that manner, right?*", so, in that case, the strategy was to contact them, provide them some instructions and include them in the pilots because "*they wanted to use it, they were ready to use it, (...) they had found the right way to the product which was exciting*". As stated by her, this approach was also supported by Microsoft know-how: "*success happens within the organization and may seem it is going viral but it is really not because the users are coming to the platform because they see added value and that was the hardest thing for me to do, was to try to lock them down.*" (INT-15). By 22/09/2014, there were already 48 groups already created, from which 17 were active during the month previous to that date. By the end of 2014, there were already 103 groups created.

INT-14 adds that the idea of the pilot groups was to find out Yammer use cases in order to have some examples available for the moment when Yammer would be launched. INT-15 describes this phase as successful because it was possible to learn by identifying successes and failures in those pilots.

d) Phase 4: Pilot Assessment & Future Implementation Plan

INT-15 considers that the pilot phase was successful. During the pilot assessment, a set of best practices were collected having in consideration the future implementation plan and the future Yammer roll-out. The initial groups were a good source of use cases to foster success and produce adoption. Change management and communication plans were also developed during this phase.

INT-14, member of INT-15 team, agrees the project was successful: "*I think it actually went really well. I think for a tool like Yammer it was a good fit. I wouldn't do it probably for all different types of tools. But, Yammer, I see it quite straight forward as a tool, and quite user friendly, so if you are interested in it, you know how to use it, it is not too difficult to post a message. I think for Yammer it fitted*

really well". She also adds it was a good approach for getting the fast movers on the platform because, by that time, it was not clear which would be the use cases.

INT-13 doesn't find the assessment of results relevant since, on his perspective, the project wasn't conducted following the right approach but rather as a normal software implementation project where the tool was just provided with limited guidance and without explaining the benefit to the users. For this interviewee, dealing with social media "*is not like [dealing with] an ERP system change where you say: These are the new processes (...) and you need to use it. Because [with social media] people simply have no obligation, they can simply just not use it and that was exactly what happened.*"

INT-16 believes the approach was very technical and organic - "*to get it going, and everyone can log in, and register and so on*"-, while the second project was much more user focused. INT-13 corroborates it: "*we didn't communicate it at all. Nothing. It was just basically who ever found it and started using it, was using it, and we didn't promote it anyway. We didn't really do anything for that. It was growing organically, I think from 2013 to mid-2015 and, then, we really had a project or initiative to really kind of launch it.*" (INT-14).

Nevertheless, as it is possible to see earlier in this section, a project plan with four phases, milestones and activities was created, as well a set of secondary documents which provided instructions and guidance to Yammer users.

INT-15 has the opinion this first initiative was a learning process. For her, the key point was to understand when to stop, re-think the approach and start explaining Yammer in a way users would understand it. "*I would call anything that happened, I believe was a learning process. I mean, good to know that it is still going within LSA because if it had failed, I think that it wouldn't still be going. People were seeing value if it is still being used. I don't think there is really anything that failed, I think we had to step back and look at our change management strategy as an entire solution with the other things we were trying to roll out at the time as well, so that they could understand what[tool] is used for what. That was the hardest thing*".

INT-16 adds one of the biggest targets was to create excitement around Yammer and keep it on, however *"this is something that we also failed over the time in one or other country (...). We created a huge excitement, yes, but have we kept them all day long? We, in some areas, needed to do change management again to get them on".*

Switching the mindset on how people worked, from a siloed/individual to a global/collaborative perspective, implies changes on individuals' working behaviours. Change management assumes an important role on that process, on INT-15 eyes. The existence of champions - early adopters that are willing to take Yammer ownership responsibilities and foster adoption by leading by example (being active on the network and motivating peers to use it) -, also seems important in the process. "*I thought it [Yammer] would create innovation, and working out loud, and collaboration (...) it was really hard in a global organization in the beginning because IT was one of the first global organizations within LSA, but other people didn't really understand how we worked as a globalized company ...*". INT-15 believed Yammer would be an important resource to enable the global IT organization. "*I thought that this tool could really help them where we struggled as global organization in IT when we, you know, we started. I thought this tool would really provide value*".

When asked about what could have been done differently, INT-15 expresses the wish to have let Yammer grow more organically from the beginning without trying to confine it to the IT strategy. However, she fully understands the need to develop policies and confine to certain roll-out strategies. One of the reasons resorts to the fact that Yammer is part of Office 365, and it is "*hard to sell it [Yammer] with SharePoint and the Office 365 entire set of products*".

As a result of this first project, several documents, DOC-4, DOC-5 and DOC-6, were developed to describe the future global launch of the product. However, there was a change of ownership in the project to launch Yammer. "...*it is easier for an individual within [Headquarters] to launch a product because you have more connections there, in a global organization. So, I believe my input to the project was valuable to the technical implementation as well to creating those pilots and initial launches... but for really go global, it needed to be structured from [Headquarters], so where all the connections were made."* (INT-15).

The initial proposed approach to launch Yammer was more complex than the one followed during the second project. Even though some of the executed tasks had already been envisioned in the initial proposal, they were executed in a different way. According to the initial plans, the launch should have happened in different phases to different types of users. As a matter of fact, Yammer was launched for all users just at once, as described in the next section.

3.2.2.2 Second Project: Preparation for Yammer Launch and Launch

"*Our very first goal was to kind of get the understanding on what's Yammer for, what are some really basic use cases where you can use it and give a couple of examples on how others are using it*." (INT-14), with a higher-level purpose to allow the exchange of tacit and explicit knowledge, as well to enable a network of collaboration. "*This was something that we advertised a lot and these are the core things that we want to tackle and then did tell it out specifically for people that don't have the opportunity to meet face to face every day*". (INT-13).

The main success criteria for INT-13 was firstly to enable that exchange of knowledge and, then, to achieve sustainable usage: "*we achieved it, we are not great, but we are in a good track, this is what we achieved more than 40% of our usage rate and we could bring a lot more content on Yammer and couples of more usages*." INT-14 also refers the usage aspect. Tryane Yammer Analytics was only acquired on the end of the project, so it wasn't possible to compare the usage before and after the project and, that way, the number of people joining Yammer groups during that time was a good indicator.

By the start of the second project, as reported by INT-13, there were around 4000 users of which less than 1 000 were active, what was considered a "*quite low number of regular usage*". Yammer environment was described as messy and with guidance missing "*A lot of people just trying it out. They didn't see any benefit and stopped using it again*". Which is in consonance with INT-14 perspective "*I think for many people it was still kind of a black box or black hole like: What should we do with it? How does it fit together with the other tools? What should be the topics we should discuss there? There were few groups I think they worked really well already, but in the beginning, we didn't have really any guidelines on what could be done.*"

The strategy followed was then to adopt a user centric approach. The goal was to show users how they could benefit by using Yammer by answering the question "What is in it for me?". Yammer top users were approached to understand their reasons for using the tool. The feedback from those users was useful to create, share and replicate some use cases: "*we decided after speaking to [MO] Japan, they use it for announcements and communication, top down communication, so we adopted it in global IT*" (INT-13). INT-16 corroborates it "[INT-13] took it from another approach, [he] was focusing specially on the use cases and the value creation, and the user focus.". A challenge for sales agents, focusing in product demonstrations, was another use case that was shown and replicated to sales managers in different regions.

However, INT-13 expresses the importance of clearly justifying Yammer introduction as part of the strategy, in this case, the IT and the organizational strategy. "*Does it relate somehow to strategic topic that we want to achieve? Does it pay in? Because if it doesn't pay in, I have no chance to get it somehow distributed in the all corporation.*" Following a strategic approach was likewise a way of "*protecting the project in one hand side and the sanity check that we did the right thing.*" (INT-13). Since the beginning, there was the idea of making a fast project with a focus on communication. "*We did it really globally, so we decided from the beginning that we would do a global launch day and we did have people from all world really joining the sessions.*" (INT-14).

According to INT-13, the approach was suited to enable Yammer in a sustainable way: *"...we focus on adoption, we focus on the preparation for growth, so having our house clean and, then, we started with the LSA management forum, where we provided insides and use cases. Then, we had the global launch day, LSA centres events in MO Italy, and so on. Gradually, we increased the number of users. Not super-fast, but it was sustainable growth...*" The approach followed was the opposite to the one adopted by the French sales organization, where they decided to invite all users to the network. As result, they logged on just once as they didn't understand the platform. *"...in this point in time we did not have our guidance ready enough to a reliable scaling of that topic.*" (INT-13).

As told before, the project was executed in a brief period of time. It took in total around three months. Figure 9 represents a high-level diagram of the project plan. In this diagram, it is possible to identify the major activities executed and project milestones.

The project had input from Microsoft and from another consultancy company that helped with the production of the user guide, the launch concept and all sorts of communication materials. The company was helpful by providing guidance on the best way to conduct the project. This phase was also characterized by some technical improvements, as the integration of Yammer with Active Directory, and some legal clarifications related to data protections and social media guidelines. On the other side, there was also the concern to identify Yammer champions, basically, the users "*who can drive and support that [Yammer]. Then, the next step was basically to go out and marketing it and show its benefit to the users.*" (INT-13).

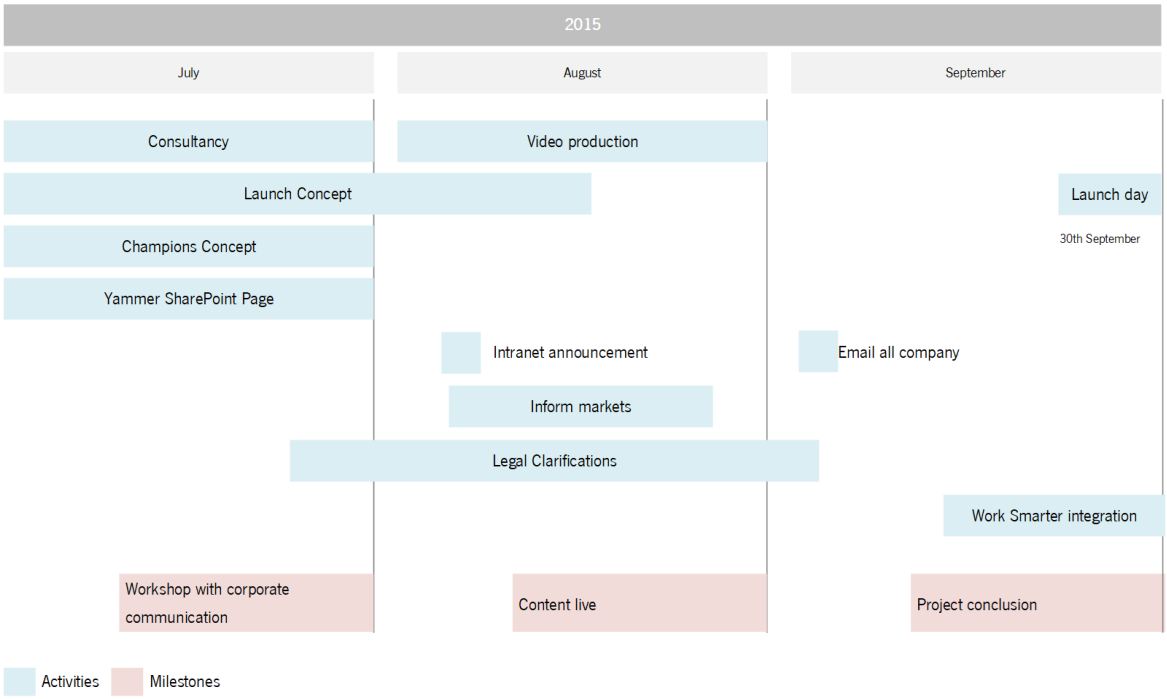


Figure 9: Project plan of the second project.

As described in DOC-7, "Support and product champions concept for Yammer", the champions' concept consisted in a network of employees that would be responsible for helping drive adoption and engagement in the local market organizations. Because these individuals are close to the users, they could better understand how they work, identify business needs and support them, in local language, if needed. In the end, they would also be responsible to give feedback to the network. The concept, by that time, was already aligned with the Work Smarter concept, which means, these individuals would have a role in promoting trainings and supporting employees using the available technologies in an efficient way, and not only Yammer. The idea would be to include specific "Work Smarter champion" targets on these individuals' working targets to officially recognize the existence of this role in the organization. However, this concept wasn't applied due to bureaucratic reasons.

During the project, as part of the "Launch Concept", a set of materials were produced to help users understanding the tool and to effectively communicate it. INT-14 referred that Intranet announcements and Yammer posts were published and emails sent out to inform employees. The RIMs, Regional Infrastructure Mangers, were also informed.

Figure 10 represents the launch concept, which was composed by an "Yammer foundation" and the effective "Yammer Launch", as explained in the DOC-8, "Yammer Foundation and Launch",

dated by 4/08/2015. The "Yammer foundation" is described as a welcome package for all users to ease Yammer's start by providing guidance and by explaining the benefits on using the tool.

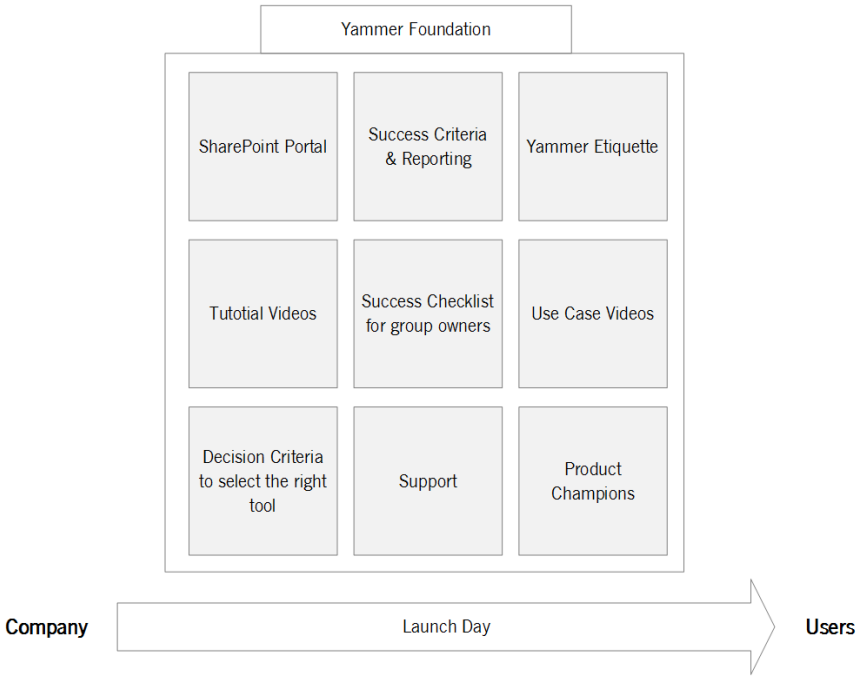


Figure 10: Launch concept

The package was constituted by nine parts:

- Portal: a SharePoint site with the foundation package information;
- Success criteria & reporting: Tryane, an external partner analytics software that provides measures about a diversified set of aspects including growth and adoption;
- Yammer etiquette: set of Yammer etiquette rules;
- Tutorial videos: explaining the platform and how to use it;
- Success checklist for group owners: set of aspects that should by accomplished for a group to be successful;
- Product champions: the champions concept and described earlier in the document;
- Use case videos: explaining some basic use cases;
- Support: related to the support provided by the champions network;
- Decision criteria to select the right tool: decision tree that helps people understanding which tool they should use in order to fulfil one existent need.

The "Yammer Launch" had the objective to make Yammer known globally in the company by introducing the "Yammer Foundation" package to all [LSA] employees. The main initiative undertaken to accomplish it was the launch day, that happened on 30th September 2015. Briefly, this initiative consisted in a full day of 30 minutes' trainings which were repeated every hour to reach people from all over the globe: "*So, early morning we had some Australian, Japanese people joining and the evening we had Americans, Canadians joining the calls.*" (INT-14) Skype was the technology chosen for the initiative and, on average, 70 people joined each session.

Throughout these trainings, people were guided through the foundation package in a dynamic way, as "*People were additionally asking questions about how they can set it up and how can they (...) use Yammer.*" (INT-14). The initiative was perceived as being successful and the interest continued after the event: "*People contacting me directly, writing on the Yammer group, asking for support, a lot of people asking for support uploading users to Yammer (mass upload). People asking about support of use cases, if Yammer is the right place for that and we helped them. We also redirected some of them and said that some of the use cases maybe are not the best to do on Yammer, it is better to utilize Skype or SharePoint to really try to position it.*" (INT-13).

The approach was always to support the users by providing information about how the platform could be useful for them. "*we did pull, we waited. Our topic was to deliver a superior product which has some benefits and, then, the pull will come on its own. It will start slow but if we have a critical number reached it will explode, that's exactly what happened.*" (INT-13).

The event also had an impact on the usage, after the launch day, the activity on Yammer started to increase progressively. Even though, INT-14 feels the impact could have been even higher if corporate communication had been more involved in the project by helping with the communication. *"...it could have had a larger effect, but in comparison to many other initiatives, I think it was quite ok.*".

Beyond the fact corporate communication should have been more involved, even by leading the project, INT-13 expresses the will to have "*a team who could drive adoption in a more professional way, working on use cases.*". INT-15 suffered from the same issue during the first project. On her perspective, "*we were really pushing it as IT but corporate communication had to take a lead role on this. We were trying for them to really step in and, because I believe they have to be totally involved in it for an entire organization to accept it. Meaning, your users and your employees see it as a communication and collaboration tool, instead of an IT driven product.".* There were several trials to involve corporate

communication in the project. The workshop with them was the first milestone of this second initiative. However, it was never possible to completely involve them in the project.

INT-13 also has the opinion that Yammer shouldn't be a burden for users and, that way, in case it wasn't successful, the best option would be to stop providing it. However, their mission was to prove Yammer made sense in the company. "*I was (..) respectful because in the beginning with all the things we did, cleaning up and preparing for the growth, we were not adding that many users, but then we started to make (...) the webinars, the global launch and (...) [showing] the use cases which we supported... Then, we saw that was growing, and when we had reached ten thousand people, it was going fairly fast. Because, then, it is a snowball principle. And it is turning, you are losing information if you are not part of it, and, then, people have the intrinsic motivation to join.*".

In 2014, at the same time Yammer started to be tested through the conduction of pilots, an initiative called Work Smarter started to be developed. DOC-9, dated by 11/06/2014, describes a scenario of collaboration, efficient communication, smarter meetings and full mobility with the slogan "Across devices. With anyone. Anywhere. Anytime". This initiative had the goal to promote an efficient way of working by using the individual and collaborative tools in an efficient way. Change management was perceived as a key aspect on that.

Yammer, due to its collaborative characteristics and its role in communication and networking, was also integrated in the plan of action of the Work Smarter initiatives. Officially, that only happened by the end of this second project, as its possible to see in the project road map in Figure 10. However, INT-15, the leader of the first project had already expressed the need to sell Yammer to the users as part of a set of technologies that should be used in an integrated way:" *[we] realized that for it to succeed, we had to have this all product, companion products, and everything they were trying to launch, so that they could understand the overall and [how] it all worked together. That was the hardest thing to sell people - what was used for, and how it was going to create value in their daily business.".*

To make the project more successful, INT-14 expresses the idea that a broader integration of Yammer as part of Work Smarter initiatives would have been needed since the beginning, and after Yammer launch. However, that didn't happen due to the small number of Work Smarter events. "*I think to really be successful you would have to kind of directly continue the follow up with people*".

Even though the project was considered to be concluded in the end of September 2015, the team continued to support users. Germany employees only saw Yammer rolled-out on January 2016 due to legal issues that precluded it from happening before.

3.2.2.3 Change of ownership to Workplace Platform Service team

By March 2016, Yammer ownership was handed over to the team responsible for the Workplace Platform Services. In December of the same year, a series of success stories related with Yammer groups that were quite active or provided interesting and different use cases started to be published on Yammer and sent by email to employees that would potentially be interested on them. As an example, if the success story was related to a group that was successful addressing internal communication in a MO, people responsible for that task in other MOs would be informed about it in order to share good practices and replicate success in other locations. In total, these success stories were viewed 3 345 times and downloaded 22 times according to Tryane Yammer Analytics.

Around this period, it was known Yammer usage varied a lot depending on the location of the MO. By navigating through Yammer, it was possible to understand there were very active and not so active countries in Yammer. In the beginning of 2017, some technical improvements on Tryane Yammer Analytics made it possible to merge Yammer data with Active Directory data. This improvement allowed to clearly track the levels of adoption and engagement per location and market organization. With that information, MOs that were not using Yammer as much as other countries started to be approached and introduced to the platform. The strategy was to find people in these organizations that would potentially be interested on the platform and explain them how the organization would benefit from using it. Market organizations from Italy, Israel, Saudi Arabia, Russia, Qatar, Ukraine, Romania and Greece were contacted, among others. Some of them started to use Yammer or improved the engagement with the platform.

INT-18 evaluates these initiatives as positive and highlights the need to continue with them: "*The feedback is usually positive. The people using it, I think, they are happy with that. I think there is still a lot of awareness to be created because some people just don't see the value as they don't know how to use it, when to use it, but I definitely see those initiatives have created a lot of awareness.*". More to add, the engagement in the platform has also increased. Since the beginning of the year 2017, "*we have been consistent over 40% [engagement]*".

Beyond those initiatives, the team continued to support users with all kind of issues related to Yammer. However, the general feeling is that is missing a more strategic approach for dealing with Yammer in the incoming years.

INT-16 expresses the need to keep the engagement and the level of excitement high. "*I would start with really structured use cases' implementation and think about how do you keep, in the next*

couple of months, (..) the excitement high and the interest high." If the interest stays high, people will just continue to go there. A *"drop of excitement and engagement is something that you need to balance, it is probably normal that you get a slight drop, but if you get a deep drop, the network is dead."* (INT-16).

INT-18 highlights the benefits of tracking interesting usage scenarios "*So, on a global level, some of the things that are done in Mexico reflect now [...] in Asia or Europe. I think that is definitely the focus that it is needed in Yammer.*" and continue with the awareness initiatives "*Now it is on that consistent phase, if we continue with these initiatives, for sure it will [increase engagement or increase usage], I think we can even do better.*".

In fact, the findings from the second part of this research initiative were useful to develop a set of strategic steps to answer some of the present and future concerns about the platform.

3.2.3 Evolution of Yammer adoption and engagement rates

Tryane Yammer Analytics provides information starting in April 2015, which means there is no data available to track Yammer adoption and engagement evolution since its very first beginning. However, DOC-10, dated from 22/09/2014, indicates that by that time there was 347 members and an average engagement of 49%. Around 18/12/2014, the network had already a total of 1317 members and an engagement of 33% (DOC-11). In February 2015, the network had 1845 members and an engagement of 27% (DOC-6). These values were collected from a limited analytics tool provided with Yammer that continues available.

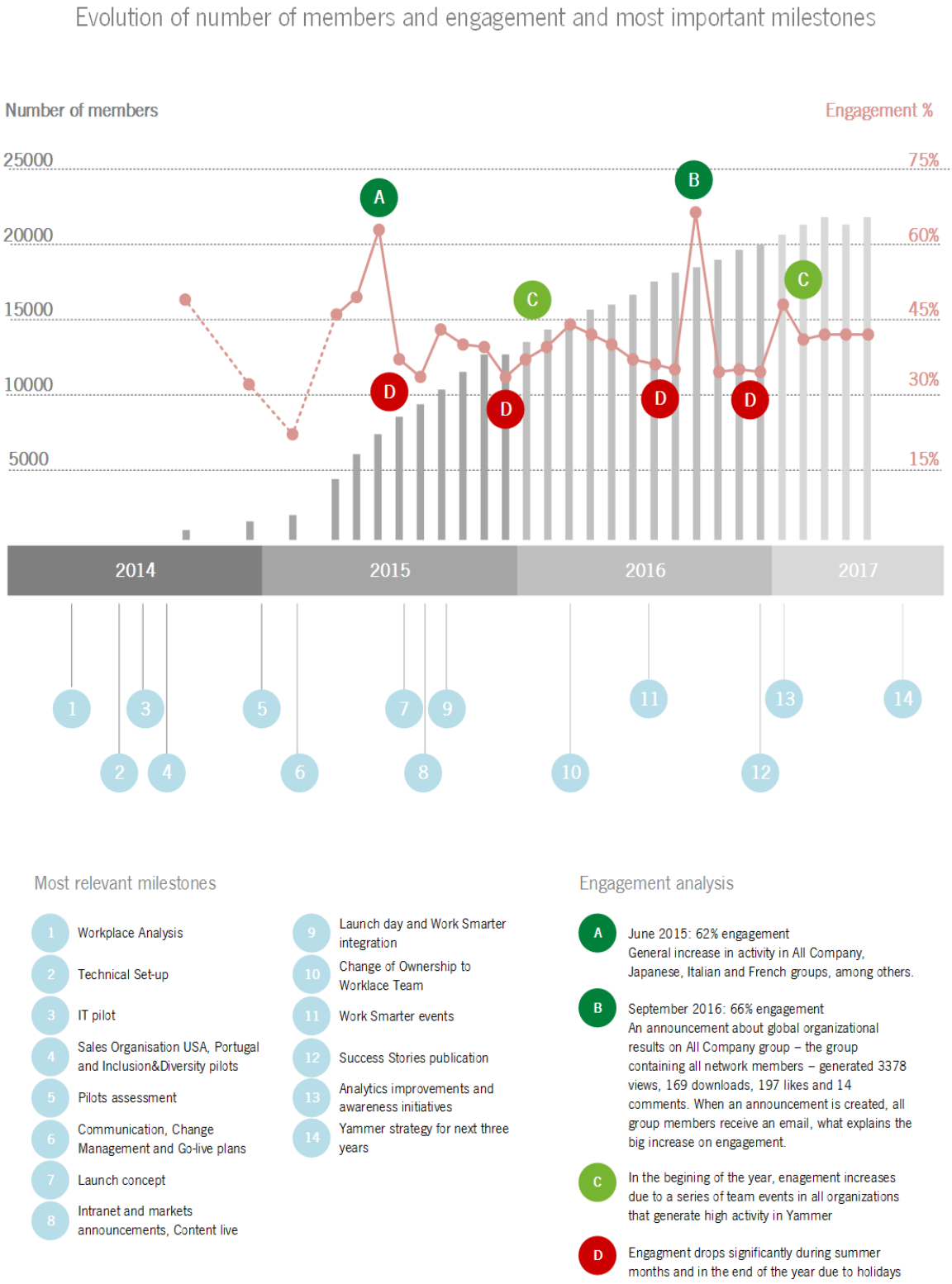


Figure 11: Evolution of number of members, engagement and most important milestones

Figure 11 shows the evolution of the number of members and the engagement of the network. The last data available from the period before Tryane Yammer Analytics - February 2015 - reported a total

number of 1845 members while the first data available on Tryane Yammer analytics, from two months after, reports already a total number of 4572 members. It is not possible to assess if the numbers are correct or if these disparities result from differences in the methods used by the platforms to measure Yammer performance. The internal Yammer dashboard only shows data one-month old, what makes it impossible to make comparisons. However, by the time this report was written, the number of users shown by both platforms didn't completely match, the difference was of around 100 users. By May 2017, the number of members was 21 277 and the engagement 42%.

From analysis of Figure 11, it isn't possible to make precise links between the initiatives undertaken during the introduction process of Yammer and the evolution of number of members. The increase of the number of members in the network seems to follow a S-shaped curve (in this case, an almost flat curve), which is in conformity with the rate of adoption of an innovation, according to Rogers (1995).

Through linear regression on the evolution of number of members in the network over time, it was possible to obtain the function $y = 727{,}92x + 330{,}65$ with a fit of 0,9661. This almost perfect fit is an evidence of an almost linear relation between the number of members in the network and time. Indeed, it was not possible to relate specific events or initiatives with increases on the number of employees that decide to join Yammer. However, it would be bold to say that the introduction process of Yammer didn't influence its adoption and use by individuals. The analysis seems to be inconclusive.

By executing a polynomial regression of second degree, the function $y = -13{,}013x^2 + 1184{,}3x - 2721$ provides a fit of 0,9885, Figure 12. This function has a maxima of Y=24224, when X=45,5. Assuming that this function describes the evolution of the number of members in the network, it is possible to foresee that a maximum of 24 224 members will be reached between the 45th and 46th month of the analysis, that is to say, between May and June 2018. However, these values are merely indicative and depend on the number of employees in the company.

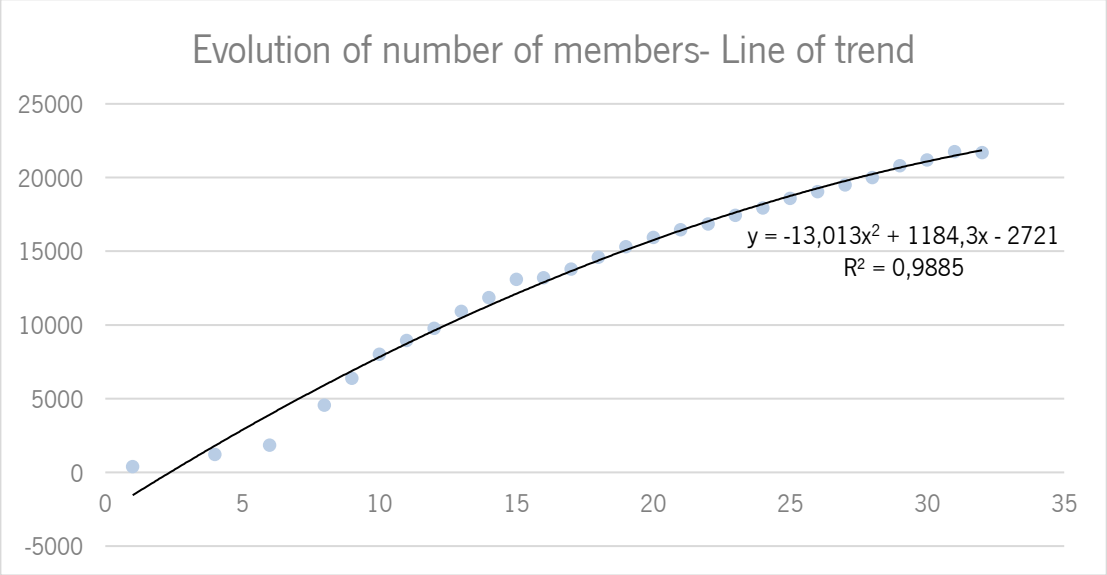


Figure 12: Line of trend of Yammer number of members

In addition to that, also from Figure 11, in opposition to the evolution of the number of members, it is possible to link engagement variations with times of the years and specific events that drag people's attention to the platform. At some extent, these results are expected because the engagement measures the activity in the platform and, thereby, it can be higher or lower. The number of members, by nature, will mainly tend to increase till a maximum point.

3.3 Discussion

The description of the adoption and introduction process of Yammer at LSA is valuable as it provides meaningful information to other companies that intend to undertake in similar processes. However, it is difficult to evaluate the success of the process. One reason resides on the impossibility to relate specific actions with increases on the number of members on the network. Another reason relates to the existence of few descriptions of similar introduction processes. Thereby, this section provides an overview of the most relevant actions and a set of reflexions by comparing these same actions with some of the learnings from the literature.

Yammer was introduced at LSA in conformity with the organizational strategy. It was clear from interviews that there was the goal to create a true global organization, characterized by an increased collaboration and communication between its employees, in order to eliminate organizational silos.

Yammer was found to be an easy to use platform that provides a place where employees could easily get in contact with each other and where all kind of information could be shared worldwide. Yammer was introduced in the organization as a solution to an identified problem.

However, it is possible that some aspects could have been better assessed in the decision process to adopt Yammer. As described, that decision was straightforward due to a set of facilitating conditions. Yammer was released as part of Office 365, without extra costs and a set of regulatory conditions were already in place. If in on side these aspects made the decision easier, on the other side they might be the reason why there are no indications that an assessment of other ESNs was performed. Yammer was the technology chosen, but it is possible that some other technologies might have fitted better the organization. Turban et al. (2011) propose a six steps framework that could have been useful in a hypothetical assessment of the tool. According to Frambach & Schillewaert (2002), as part of other factors, the decision to adopt an innovation is influenced by environmental aspects. Supplier marketing efforts seem to be part of these environmental influences, and, in this specific case, Microsoft had, for sure, an important influence on the decision to adopt Yammer.

Along with the decision to adopt a technology, it is necessary to assess the level of customization needed. Yammer is an external vendor tool, thereby, the organization is only able to suggest improvements on the platform, suggestions that might be implemented one day if they fit Microsoft's vision for the tool. On the other side, the organization also needs to adapt to the new tool. Yammer implies changes on the way individuals work. This work reorganisation needs to be a balance between what the organization wants to achieve and what the individuals are willing to change. As INT-15 expressed during the interviews, the way the organization envisioned Yammer during the pilot phase was not always followed by users. However, it is important to have the higher levels of the organization hierarchy aligned, by sharing the same vision about Yammer and using it. That way, users in the middle and lower positions of the hierarchy will have more motivating factors to think on Yammer, try it and, hopefully, use it.

As stated by Rogers (1995) and reported in the literature review - chapter 2 -, the innovation diffusion happens through the exchange of information between an entity that uses it or has experience using the technology and another entity in the opposite situation. Rogers also refers that opinion leaders are important to activate the diffusion network due to their ease in influencing other individuals' attitudes. Interpersonal channels are perceived as being more effective on this task. The champions network, a network of trained users to support their local communities in several technological aspects, Yammer included, that was proposed during the second Yammer introduction process, is a concept that meets

these ideas. Innovation diffusion process depends on the technology itself, on the way its communicated, on the social system of the target group and on time (Rogers, 1995). A local champion would be someone who understands the structures and norms that characterize their specific social environment, and, that way, he or she would be higher prepared to develop and implement more effective initiatives to disseminate Yammer.

One of the main ideas from this introduction process is that Yammer is not a mandatory tool to use. However, the tool needs to be explained to the users for them to understand why and how to use it. By clarifying the tool to the users, unexpected consequences of the adoption as unappropriated use of the tool or rejection can be avoided. INT-13 expressed clearly the idea that the main success criteria to promote Yammer usage resorts in showing the value or benefit of using such tool because the rules governing social media are different from the ones governing other mandatory tools. If Yammer use is not mandatory, users will only use it if they perceived some return out of it, even more if they have busy work routines and they have to prioritize the activities they spend time with.

The conduction of pilots seems to have been a positive decision due to different reasons. If, on one side, it made it possible to understand if the use of Yammer would bring benefit for the company in practical terms, on the other side, it was also useful to create the first usage scenarios that would then be shared with the future users to show them the benefits of using the tool. The effort creating a set of initiatives to communicate with the employees was also useful as the use of mass media channels has a great power spreading knowledge. However, as discussed before, personal contacts are more effective promoting adoption (Rogers, 1995).

The development of guidelines and documentation with learnings from pilots, where the benefit from using Yammer was explained in a way each employee could potentially relate the platform with his or her needs, and the personalised awareness initiatives undertaken mainly in the last and current phase of Yammer at LSA, are perceived as positive. In the last case, the existence of an analytic platform with customized features was essential to identify the areas of intervention where the initiatives were developed.

A common point across the interviews was the importance and need to assess success across the network. Indicators as number of members, engagement and overall activity are important in that task, mainly when the number of users actively participating is the foundation of a healthy social network. In addition, specific expected outcomes from introducing an ESN should be defined since the beginning of the introduction process, as there will be a moment when the organization needs to understand if the

use of the platform is producing business value. At LSA, this is a current business concern. Faria & Sousa (2017) provide further developments on the topic of ESN success with evidences from this same organization.

In summary, the adoption and introduction process of Yammer at LSA seems to have been successful. Despite it, it is not possible to relate specific actions with increases on the number of members on the platform, and there is a set of mixed opinions about successful approaches and not so successful approaches. By May 2017 the network had 21 277 members and an engagement of 42%, three years after Yammer started to be introduced at LSA. More detailed recommendations for organizations that intend to develop similar introduction processes can be found in section 5.3.

4. PART II: WHAT ARE THE FACTORS INFLUENCING INDIVIDUALS' USE OF YAMMER AT LSA?

This chapter pursuits the goal to identify a set of factors that influence Yammer usage at LSA in order to answer the sub-research question "What are the factors influencing individuals' use of Yammer at LSA?".

4.1 Methodology

Part II follows a mixed methods research approach which involves the collection of both qualitative and quantitative data as response to the research question. The combination of qualitative and quantitative approaches provides a more complete understanding of a research problem. Thus, both forms of data should be correlated afterwards (Creswell, 2014).

The value of mixed methods resides on the idea that all methods have weaknesses, thus, collecting both quantitative and qualitative data can be a way to try to neutralize the weakness of each form of data (Creswell, 2014). This research study follows an exploratory sequential mixed method, see Figure 13, which means a qualitative research will precede a quantitative research. That way, firstly a set of perceptions, opinions and descriptions of events will be collected and analysed in a qualitative research phase – Phase 1. Then, the results will be used to develop an instrument that will be then validated during the quantitative research phase – Phase 2.

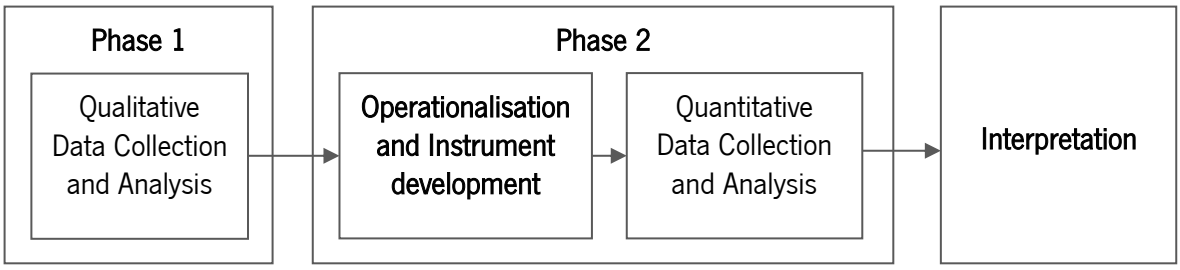


Figure 13: Research design diagram

Operationalisation of concepts into variables and propositions into hypothesis and the development of the instrument are useful procedures to move from qualitative data analysis to scale development. Qualitative data analysis will produce quotes, codes and themes that can be used for

building instruments and scales (Creswell, 2014). In Interpretation, the results from both phases are discussed and a set of learnings will arise.

Table 8 summarizes the methodological approach adopted in Part II of this master dissertation.

Table 8: Part II methodological overview

	Phase 1	Phase 2
Research approach	Mix methods	
Philosophical overview	Pragmatic Worldview	
Research design	Exploratory sequential mixed method	
Strategy of inquiry	Qualitative	Quantitative
Research methods	Multiple case study	Survey research
Data collection methods	Semi-structured interviews	Questionnaire
Data analysis methods	Content analysis	Structural equations modelling

Each phase research, data collection and data analysis methods will be further explained in the following sections 4.2.1, 4.2.2 and 4.2.3 – Phase 1- and 4.3.1, 4.3.2 and 4.3.3 – Phase 2.

4.2 Phase 1

This first phase has the main goal to identify a set of factors that influence Yammer use and to develop a set of propositions that describe the relationship between those factors.

4.2.1 Research method

Phase 1 follows a multiple case study. The research method used was recommend by Yin (2009) and was previously described in section 3.1.1.

The guidelines proposed by Yin (2009) were not strictly applied. The research question was previously defined and interview questions were developed based in learnings from the literature. The units of analysis, in this case, is each one of the interviewees as the focus is to collect their perceptions and opinions regarding Yammer. In what concerns to the quality control, all the process from interviewee selection to proposition formulation was supported by methods already applied and described in literature – Plan, Design and Prepare. Data collection and data analysis methods are further explained in section 3.1.3 and 3.1.3 – Collect and Analyse. Section 3.1.3 presents the findings – Share.

4.2.2 Data collection methods

4.2.2.1 Interviews

a) Interviewees

In total, 12 interviews were conducted. The interviewees were selected randomly from a dataset exported from Tryane Yammer Analytics which shows user activity on the network during the period between 6th of March and 12th of March 2017. Even though the analytics are relative to a period of a week, the platform categorizes users in four adoption profiles having in consideration their account activity during the four previous weeks:

- Very engaged: users who have posted more than 10 messages in the last 4 weeks;
- Engaged: users who have posted 1 to 9 messages or at least one like in the last 4 weeks;
- Viewers: users who haven't contributed to the network, but at least have visited it at least once in the last 4 weeks;
- Inactive: users without any activity in the last four weeks.

In the end, four of the interviewees were categorized as very engaged, three as engaged, two as viewers and three as inactive on Yammer. Table 9 shows some generic information about the interviewees.

Table 9: List of interviewees

Interviewee ID	Gender	Location	Function	Adoption profile
INT-1	Male	Saudi Arabia	Area sales manager	Very engaged
INT-2	Female	Belgium	Product manager	Engaged
INT-3	Male	Portugal	Engineer	Very engaged
INT-4	Female	Headquarters	IT intern	Engaged
INT-5	Male	Headquarters	Product manager	Inactive
INT-6	Female	Brazil	Finance	Engaged
INT-7	Male	Ireland	Product manager	Very engaged
INT-8	Female	Indonesia	Human resources	Viewer
INT-9	Male	United States of America	Territorial sales	Very engaged
INT-10	Male	Denmark	Territorial sales	Inactive
INT-11	Female	Malaysia	Product manager	Viewer
INT-12	Female	Russia	Sales coordinator	Inactive

b) Interview questions

The interview questions were elaborated having in mind the stages for individual innovation-decision process as proposed by Rogers (1995). Therefore, each interviewee was asked questions that relate to each phase of the model. The interviews were semi-structured, what allows the interviewer to have a more present role by shaping the interview to focus on aspects perceived as important to the core of the research, instead of following a strict interview guide (Brinkmann, 2014).

Even though, in the beginning, a higher number of questions was planned, over the interviews conduction process, users started to speak about topics that would only be questioned in the following questions. That was an indication questions were sometimes too specific and detailed. Because of that, the strategy, in those cases, was to simplify the interview by not asking questions that would lead to similar answers and increase interviewee fatigue. Instead, the approach was to go deeper into topics referred by the interviewee or to tackle aspects that have been recurrent in other interviews.

Sometimes, it was evident that users didn't have a clear mental distinction between the moments "decision" and "implementation" and the factors influencing each of them, mainly if they were using Yammer for quite a while. That way, asking about the factors pushing forward their decision to adopt Yammer and the positive aspects about using the tool, for some users would just mean the same or generate similar answers. That way, in some cases, only one of the questions was made.

Table 10 presents the basic set of questions that guided the interviews. However, because the interviews were semi-structured, the final set of questions and the order in which they were asked was different from user to user.

Table 10: List of interview questions

Stages for individual innovation-decision process	Questions
Knowledge	• How did you get to know about Yammer? • Was someone involved in the process of introducing Yammer? • Did you look for information about Yammer?
Persuasion	• Did you look for your peers' feedback?
Decision	• What were the factors pushing forward your decision to adopt Yammer? • What are the factors inhibiting your decision to adopt Yammer?
Implementation	• What are the positive aspects on using Yammer? • What are the negative aspects on using Yammer?

Stages for individual innovation-decision process	Questions
Confirmation	• Do you have the intention to continue using Yammer? • What is your overall opinion about Yammer?

The interviews were conducted by Skype and recorded using Skype for Business Recording Manager for eleven of the interviewees. One interviewee was interviewed face to face, in a meeting room, and the interview was recorded using Windows Voice Record. In total, the interviews sum up to a total of 4 hours and 25 mins of audio recording. All the interviews were then transcribed using oTranscribe.

4.2.3 Data analysis methods

Content analysis was the methodology adopted to analyse the interviews. This text-based method is used to analyse different types of information sources as newspapers, web pages or speech (especially interview data). Content analysis, as the name suggests, it is a method of analysis, so it needs to be integrated in wider methodological approaches that provide systematic data collection methods (Prior, 2014).

This study, follows a content analysis strategy suggested by Saldaña (2014) with focus on codes and codding. More specifically, the interviews were analysed following a descriptive coding methodology. In a brief way, the strategy was to identify patterns and to construct meaning out of data by assigning codes to specific segments of texts that can go from just a word to a full paragraph. Codes are mainly nouns that summarize the topic of that portion of text. Then, codes can be grouped in categories. Categorizing is an interpretative process that clusters codes with similar meaning in categories to develop patterns.

The codding and categorization process was undertaken using a Computer Assisted Qualitative Data Analysis Software (CAQDAS), more specifically QDA Miner, a freemium qualitative text analysis software on its basic version, QDA Miner Lite. This software allows to upload files in different data formats, to add comments to specific portions of text as well to code them (Provalis Research, 2004). CAQDAS is useful for storing the data, and to enable the researcher to code the data and produce different types of statistical analysis. However, the use of software is not essential for qualitative analysis (Saldaña, 2014). QDA Miner Lite was useful to code the interviews and to organize the codes in categories. As the existing codes are always visible, it is easier to identify if a code can be reused to code a specific aspect or if there

is the need to create a new one. On the other hand, codes can easily be assigned and moved across categories using this tool.

4.2.4 Findings

4.2.4.1 Codes and categories

Table 11 shows the list of categories and the respective codes which resulted from the codding process of the end users' interviews. Each code has a brief and neutral description to make its meaning clearer. Presenting descriptions in a neutral way is also denotative of the way the codding process was conducted. As an example, the code "Manager" was applied every time an interviewee has mentioned the "role of platform and community managers" through the interview. The purpose wasn't to highlight relations, polarities or intensities through the codding process.

Even though the idea was to code data without any type of framework behind not to exclude any important information that potentially wouldn't fit the framework, it was impossible not to have in mind the models studied during the literature review phase. That way, some of the codes and categories' names were inspired in AUCT, the model from Brown et al. (2010), and in the model SRNS, proposed by Bullinger et al. (2011). As an example, this second model, which explains the adoption of collaboration technology among researchers, addresses one recurrent topic during the interviews, more specifically, the topic of noise. However, that approach wasn't an impediment to identify relevant aspects influencing the usage of Yammer at LSA.

Table 11: List of categories and codes

Category ID	Category	Category description	Code ID	Code	Code description
CAT-1	Platform management	Degree to which the platform is being well managed	COD-11	Manager	Role of platform and community managers
			COD-12	Policies	Importance of enforcing usage rules/policies
CAT-2	Platform introduction process	Extent to which users perceived they were introduced to the platform	COD-21	Utilization guidance	Initiatives to explain/support users using Yammer
			COD-22	Usage incentives	Initiatives undertaken to encourage Yammer usage
CAT-3	Platform understanding	Extent to which users understand the platform	COD-31	Objectives	Understanding Yammer objectives
			COD-32	Usage information	Understanding how to use Yammer
CAT-4			COD-41	Content structure	Structured content

Category ID	Category	Category description	Code ID	Code	Code description
	Platform content quality	Platform content level of quality	COD-42	Content update frequency	Updated content
			COD-43	Content relevance	Relevant content
CAT-5	Platform communication immediacy	"extent to which a collaboration technology enables the user to quickly communicate with others" (Brown et al., 2010)	COD-51	Tool communication efficacy	Yammer efficacy in the communication process
			COD-52	Quickness	Time for communication to happen
CAT-6	Platform environment	Set of aspects which describe Yammer environment	COD-61	Enjoyment	The feeling Yammer provides an enjoyable environment
			COD-62	Working feeling	The feeling Yammer is a platform used to work
			COD-63	Informal interaction	The feeling Yammer way of interaction is informal
			COD-64	Professional environment	The feeling Yammer environment is professional
CAT-7	Critical mass	"point where enough users have adopted an innovation so that there is an acceleration of adoption of the innovation where upon it becomes self-sustaining" (Sledgianowski & Kulviwat, 2009)	COD-71	User base	Importance of having a considerable number of users on Yammer
CAT-8	Platform accessibility	Extent to which the platform is easily accessible	COD-81	Works across device	Yammer ability to work across different devices
			COD-82	Works across network	Yammer ability to be easily accessible network independently
CAT-9	Platform effort expectancy	"degree of ease associated with the use of the system" (Venkatesh et al., 2003)	COD-91	User-friendliness	Yammer user-friendliness
			COD-92	Ease of use	Yammer ease of use
			COD-93	Simplicity	Simplicity in using Yammer
			COD-94	Effort	Effort in using Yammer
CAT-10	Platform integration	Degree of integration of Yammer with other platforms	COD-101	Integration with other platforms	Level of Yammer integration with other platforms
CAT-11	Social environment	Set of aspect related to the social support of Yammer users	COD-111	Management support	Management support on Yammer usage
			COD-112	Peers feedback	Yammer feedback received from peers
			COD-113	Social influence	Influence of others' behaviors when using Yammer
			COD-114	People pushing	Influence of having people directly asking for people to use Yammer
CAT-12	Noise	Existence of a "significant set of software applications available to perform their activities, a multitude of communication channels" and "an increased	COD-121	Dispersion of information	Dispersion of information due to the existence of multiple information sources
			COD-122	Technology overlapping	Feeling of having different technologies with same functionalities

Category ID	Category	Category description	Code ID	Code	Code description
		information overflow". (Bullinger et al., 2011)			
CAT-13	Organizational culture	Aspects related to the influence of organizational culture	COD-131	Organizational Culture	Influence of organizational culture
CAT-14	Individual	Set of individual aspects that influence the use of Yammer	COD-141	Time	Individual's lake of time/busy work routines
			COD-142	Language knowledge	Individual's language knowledge
			COD-143	Confidence	Individual's confidence in using Yammer
			COD-144	Prioritization	Decision to use time in other activities or focus in other technologies
CAT-15	Technological background	Aspects related to individuals' technological experience and knowledge	COD-151	Technological experience	Individual's experience in using technologies like Yammer
			COD-152	Technological education/knowledge	Individual's technological knowledge/education
CAT-16	Performance	Extent to which using the platform affects work performance	COD-161	Performance	Performance impact by using Yammer
CAT-17	Value expectancy	The return expected by using Yammer	COD-171	Benefit expectancy	Expected benefits by using Yammer
			COD-172	Utility expectancy	Expected utility by using Yammer
CAT-18	Value	The return by using Yammer	COD-181	Collaboration	Role of Yammer promoting collaboration
			COD-182	Communication	Role of Yammer promoting communication
			COD-183	Community feeling	Role of Yammer promoting community feeling
			COD-184	Different type of communication	Role of Yammer promoting communication
			COD-185	Get to know the company	Role of Yammer helping employees to know the company
			COD-186	Global information	Role of Yammer in accessing to global information
			COD-187	Increase motivation	Role of Yammer in motivating employees
			COD-188	Information	Role of Yammer accessing information
			COD-189	Interaction with colleagues	Role of Yammer promoting interaction between colleagues
			COD-1810	Knowledge exchange	Role of Yammer promoting knowledge exchange
			COD-1811	Local information	Role of Yammer in accessing local information
			COD-1812	Networking	Role of Yammer promoting networking
			COD-1813	Recognition	Role of Yammer promoting employees' recognition

Category ID	Category	Category description	Code ID	Code	Code description
			COD-1814	Sharing platform	
			COD-1815	Success stories	Role of Yammer sharing success stories
			COD-1816	Training	Role of Yammer in training

4.2.4.2 Codes and categories analysis and proposition formulation

According to Prior (2014), "the researcher highlights given themes that are said to have emerged out of the data and provides appropriate extracts from the interviews to illustrate and substantiate the relevant themes". Saldaña (2014) emphasizes the importance "to create an evocative literary representation and presentation of the data in the form of creative nonfiction". Thereafter, following the above statements, in this section, the main ideas related to each of the resulting categories are described and validated recurring to extracts from the interviews. There was the concern to present interviewees declarations with background information in order to avoid decontextualization of statements (Brinkmann, 2014).

In addition, a set of propositions, that is, a set of statements that explain the relationship between certain concepts (Yin, 2009), was formulated. Propositions can be derived from sources as literature, theories, personal experience or empirical data (Baxter & Jack, 2008). In this study, they were generalized from the interviews analyses and try to explain links between the codes and categories that arose from the codding process. Propositions "form the foundation for a conceptual structure/framework" (Baxter & Jack, 2008), which means that they are not only important by providing already possible explanations into the topic in study, but also by establishing the conceptual foundation for the incoming Phase II, as it is further explained in section 4.3.

In the course of this section, for each category, a table is presented highlighting the codes that belong to each category, the code count, that is the number of times a specific code was used during the 12 interviews, the percentage of interviews in which the codes were used and all the interviewees whose statements have been codded using those same codes.

a) CAT-1: Platform management

Table 12: Codes from the category Platform management

Code ID	Code	Code Count	Interviews (%)	Interviewees
COD-11	Manager	4	16,7%	INT-3; INT-11
COD-12	Policies	7	33,3%	INT-3; INT-5; INT-10; INT-11

Weak policies to regulate Yammer usage are perceived to be the reasons for content with low quality. These policies, on INT-3 eyes, should scope "*a strategy in which we could limit the way groups are created*" and the creation of a "*global manager*". INT-11 believes "*not everyone can simply build up a group with no clear objective*". These policies should also address the way users make use of these groups to avoid having "*users putting up information that is not directly relevant to the initial objective of the page*" (INT-11). On the other side, the community manager seems to have an important role ensuring the information is consistent and updated - "*it depends sometimes on the community manager. It actually depends on how the manager is managing the page, if the content is consistent and, then, if it is updated regularly and consistently, once in the week, or once in the day*" (INT-11).

Proposition 1: A good platform management, by the enforcement of policies and an active role of managers, will positively impact platform content quality.

b) CAT-2: Platform introduction process

Table 13: Codes from the category Platform introduction process

Code ID	Code	Code count	Interviews (%)	Support
COD-21	Utilization guidance	22	66,7%	INT-1; INT-3; INT-6; INT-7; INT-8; INT-9; INT-10; INT-12
COD-22	Usage incentives	5	25%	INT-2; INT-9; INT-11

For the interviewees, the importance of an introduction process to Yammer is clear. This introduction process can be in the form of an easy face-to-face training where people are told about Yammer objectives, benefits and usage. "*I think I was invited to the network or the role of Yammer in sharing information and experiences between employees was presented to me. Well, I was curious and decided to register myself in the network*" (INT-6). INT-1 highlights the importance of having an easy and

well explained guidance, in the form of a tutorial, covering aspects like "*how to use it, how to upload pictures, how to go in the group, how to create groups*".

Hence, the introduction to the platform is intimately related to its understanding, acting as a mean through which users or future users can better perceive it. Most of the interviewees refer they received information about Yammer through organizational email announcements, through supervisors or through other departments, however, it seems that only in two or three cases, the information received was good enough for them to clearly understand Yammer and start using it. INT-9 is one of the interviewees with whom the approach seems to have worked - "*He indicated that was a very good resource, and that was a way to stay in contact with different parts of [LSA], and to be up to date on things that might be occurring. He encouraged me to join and also post something that reached deep and wide throughout the organization, and so it was something that would be beneficial to be aware of and, you know, review regularly [Yammer] as well as participate as much as possible*" (INT-9).

Another interviewee expresses the importance of a correct use of the tools, highlighting that "*the main part of Denmark would probably use it[Yammer] if instructed in the right way*" (INT-10). As an example, he refers that after a brief introduction to digital technologies, where employees have received information about LinkedIn, among other technologies, he realized some of his colleagues that didn't use LinkedIn before, had started using it. So, on his perspective, "*it is not a matter of using lots of time of instruction and teaching how to use Yammer, but just a guidance, what is this? What's the idea, what's the strategy of introducing Yammer? What are you supposed to use it for? How can it help me? These kinds of information would be tremendous.*"

For another interview "*The main challenge now is to launch it. To begin using Yammer and to show people that is easy, useful and the worth trying.*" (INT-12).

Proposition 2a: Guidance and support regarding how to use Yammer and Yammer goals will positively impact users' platform understanding

The development of specific initiatives to engage users in the platform - usage incentives - seem effective. "*We started to use [Yammer] as an incentive, so we had to go, and then it started to be more common*". The idea was for sales agents to upload photos or videos of product demonstrations, what engaged the overall community in the platform. A similar situation happened with INT-11.

According to INT-9, Yammer was introduced to him during his initiation training in the company. It was the platform used to upload assignments.

Proposition 2b: The development of Yammer initiatives, or usage incentives, will positively impact Yammer use

c) CAT-3: Platform understanding

Table 14: Codes from the category Platform understanding

Code ID	Code	Code count	Interviews (%)	Support
COD-31	Objectives	21	58,3%	INT-2; INT-3; INT-4; INT-5; INT-8; INT-10; INT-11
COD-32	Usage information	20	58,3%	INT-1; INT-6; INT-7; INT-8; INT-10; INT-11; INT-12

Interviewees refer the importance of understanding the platform objectives and strategy, as well the platform itself. In one side, individuals feel they clearly need to understand the reasons for using Yammer - "*What's the idea, what's the strategy of introducing Yammer?*" (INT-10), "*it is just more about why we are using it more?*" (INT-8), "*I do not really know what is the objective of having this*" (INT-11), "*There is always a new toy. Then, no one understand for what it is.*" (INT-5).

This need for objectives goes from global level - "*really clear objectives on why Yammer is assisting in [LSA], clear objectives*" (INT-11) - to local level - "*without really understand, actually, what is the direction of the MO and Marketing Department on using it as a platform to interact with the users in our MO. That was not very clear in the first phase.*" (INT-11).

From another side, they also need to know what is possible to do with Yammer. INT-10 compares it to a giant tool box - "*it was just like a giant, huge, tremendously big tool box where you just throw a ball and you (...) drown into them, and you don't explain what is actually in the tool box.*". Most interviewees have received email announcements about Yammer. INT-7 says: "*the information at the time just an email highlighting what it is and how to use it*". The problem of not clearly understanding the tool which is being provided is that users will not realize how the tool can be helpful for them and they won't feel the trigger to start using it. INT-10 adds: "*So, that's why I made the decision to focus on other places.*". INT-12, regarding the moment when Yammer and Office365 tools were introduced in Russia also says: "*we got it but we got nothing about it, no tutorials, no information, it was just like a tool for us*".

From all the interviews, the topic related to codes as "platform objectives" and "platform information" is more present in individuals that use Yammer in a limited way or don't use it at all, which can be an evidence of platform understanding importance in value awareness creation and end usage.

"*I had to focus on my information level, so I actually cut it down to not receiving any information from Yammer. And, actually, I'm quite sorry about that because it is the same thing that happened to other online tools that I don't think we have even received information about it yet.*" (INT-10).

Proposition 3: A good understanding of Yammer, more specifically, its goals and its ways of usage, will positively impact the expected value from using it

d) CAT-4: Platform content quality

Table 15: Codes from the category Platform content quality

Code ID	Code	Code count	Interviews (%)	Support
COD-41	Content structure	5	33,3%	INT-3; INT-5; INT-6; INT-11
COD-42	Content update frequency	1	8,3%	INT-11
COD-43	Content relevance	16	58,3%	INT-4; INT-6; INT-7; INT-9; INT-10; INT-11; INT-12

When asked about negative aspects of Yammer, some users refer the problem of the relevance, structure and level of information up-to-dateness on Yammer. INT-3 adds that "*people start to create different groups and then the information starts to disperse*". INT-11 refers the "*organization of the content, in terms of how are people using it [Yammer], and also the structures of the content just seem very messy and not so professional.*"

When users consider themselves to have very busy work routines and lack of time to be reading all the information they have access to, having a clear structure of information and a clear separation between what is relevant information and not so relevant information on Yammer, seems to be important. However, the perception for INT-10 is that Yammer doesn't fulfil these requirements yet. "*I could see on a weekly basis that 95%, maybe not 99% or 100%, of the information that I receive from Yammer was only not even nice-to-know, but nice if we had the time to see it, otherwise it didn't make any sense and I didn't have the time to see it*" (INT-10).

INT-5, who is inactive on Yammer, compares a good Yammer structure to a newspaper, where he clearly could read news organized by chapters. That way, each Yammer group would be like a channel used for handling the communication of different departments or specific topics. However, this kind of structure is much like the one existing currently, where different groups are created to handle

collaboration and knowledge exchange at department, local, regional and global level. Some work can be done, however, to define clear group naming conventions to make it more visible and understandable.

"*And then different channels may exist. A channel for [product name], a channel for [product name], a channel for board. The same way I read sport or politic news, the same way I read news by chapter, whoever has interest in specific things can contribute. In that sense, I think Yammer can be an interesting platform that doesn't exist yet.*" (INT-5)

Proposition 4: A good content quality will positively influence the value expect of using Yammer

e) CAT-5: Platform communication immediacy

Table 16: Codes from the category Platform communication immediacy

Code ID	Code	Code count	Interviews (%)	Support
COD-51	Tool communication efficacy	3	16,7%	INT-2; INT-6
COD-52	Quickness	3	25%	INT-1; INT-5; INT-7

Two interviewees have expressed the idea that email is more effective than Yammer when sharing important information: "*A serious thing we will communicate by email. And everyone will receive the info correctly, at good time. Yammer, you can check wherever you want, sometimes you don't check for two days or three days, and you have to catch up what was posted.*" (INT-2), "*In my case, when I share some finance information, I have to be sure people read it, so I still prefer email because I still feel that not everyone accesses [Yammer]. I can't be safe that everyone has received the information.*" (INT-6).

On the other side, INT-1, among others, has the opinion that Yammer is "*very very quick*". INT-7 even refers that "*with emails, it is a slower process*".

Proposition 5: High Platform communication immediacy will positively impact Yammer use

f) CAT-6: Platform environment

Table 17: Codes from the category Platform environment

Code ID	Code	Code count	Interviews (%)	Support
COD-61	Enjoyment	10	33,3%	INT-2; INT-6; INT-8; INT-10
COD-62	Working feeling	10	41,7%	INT-1; INT-2; INT-7; INT-8; INT-11
COD-63	Informal interaction	3	25%	INT-2; INT-4; INT-6
COD-64	Professional environment	9	33,3%	INT-1; INT-6; INT-11; INT-12

Interviewees seem to perceive a professional and informal environment as an advantage of Yammer. "*it is very professional, quite focused on company content. I think people keep a formal behaviour*" (INT-6). Another interviewee, INT-4, expresses the idea that the environment should be more informal, in a degree that stills appropriate for work environment, for people to feel free to post more about their work routines: "*if you have even small news, you could share it, and then maybe someone will benefit from it a bit.*".

Proposition 6a: A professional environment where people interact in an informal way will positively affect Yammer use

A set of expressions as "*fun*", "*relax*", "*break of work*" or "*hobby*" also describe a more pleasant facet of the platform. Some users refer they don't use Yammer as a task "*I don't think people see it has a task to use Yammer, people are encouraged to use Yammer but they are not forced to use Yammer*" (INT-7). Other interviewee, INT-2, doesn't recognize Yammer as a working platform "*I know we have to work with that [Office365], which can facilitate our work, [we] can be more efficient, but I don't take Yammer in that. It is more linked to the fun part then*". If, in one hand, this enjoyable environment can be an important aspect when using Yammer - "*it would be just to me personally a stop if we then consider Yammer as a real working platform*" as INT-2 adds -, on the other hand side, a not so direct relation between Yammer and work performance can be an inhibitor for Yammer usage - "*Someone needs to set really clear objectives on why yammer is assisting in [LSA], clear objectives, is this just a simple social platform, or that should be a platform that people use really for work?*" (INT-11).

Proposition 6b: An enjoyable environment will positively affect Yammer use
Proposition 6c: Perceiving Yammer as a working platform seems to impact Yammer use, however the polarity of the impact is not clear.

g) CAT-7: Critical Mass

Table 18: Codes from the category Critical mass

Code ID	Code	Code count	Interviews (%)	Support
COD-71	User base	6	71,7%	INT-2; INT-4; INT-6; INT-9; INT-10

The number of users using Yammer seems to be an important factor for social networks success. Indeed, "*the benefit from them [these platforms] is generated a lot from the contributions users are making, (...) I think it increases that way.*" (INT-9). Thus, it seems important "getting everybody involved", as INT-4 says.

Another interviewee, INT-10, refers the importance of having the people you know on the platform: "*actually very small percentage of the people I've met actually had an account on Yammer. So, first time, I thought it was more like a personal option you could use if you wanted to and I did not used that much because, again, I actually didn't reach out that good*". INT-6 expresses the will to have more people from Finance involved: "*Maybe more people from Finance involved, even to encourage. I see more about the Sales or Engineering Department, maybe Marketing, much more than Finance.*"

INT-8 adds: "*if could have more employees here to have that interest in post the activities, I would say that it will push the traffic.*".

Proposition 7: A higher number of users will positively affect Yammer use

h) CAT-8: Platform accessibility

Table 19: Codes from the category Platform accessibility

Code ID	Code	Code count	Interviews (%)	Support
COD-81	Works across network	5	8,3%	INT-1
COD-82	Works across device	3	16,7%	INT-1; INT-7

One positive aspect referred by two of the interviewees relates to the easy access to the platform because "*everyone in the company have access on it*" (INT-1) across every network. That means users don't need to be on the corporate network to have access to Yammer. This behaviour is perceived as an advantage because it doesn't happen with all the organizational applications.

With Yammer, the user only needs to login by introducing their user credentials. The access is perceived as a "*very easy access*" (INT-1). Adding to this topic, the existence of a Yammer mobile

application allows users to access and use it across device. INT-1 has expressed his satisfaction: "*The best thing I like in Yammer is the application form. It can work remotely*", "*you have access in the mobile without anything, just the connection*". The same idea is shared by INT-7: "*I use it on the application on my phone and I also use it on my tablet as well.*", "*especially with mobile phones usage now, we all have a smartphone, so the app is very handy*".

Proposition 8: Higher platform accessibility will positively influence Yammer use

i) CAT-9: Platform effort expectancy

Table 20: Codes from the category Platform effort expectancy

Code ID	Code	Code count	Interviews (%)	Support
COD-91	User-friendliness	10	50,0%	INT-1; INT-2; INT-6; INT-7; INT-9; INT-12
COD-92	Ease of use	21	75%	INT-1; INT-2; INT-4; INT-6; INT-7; INT-8; INT-9; INT-10; INT-12
COD-93	Simplicity	7	41,7%	INT-2; INT-3; INT-5; INT-7; INT-8
COD-94	Effort	4	25%	INT-2; INT-3; INT-5

Generally, Yammer is perceived by the users as user-friendly and easy-to-use. "*it is relatively simple to use and I think it is user friendly and I think the experience is that very smooth.*" (INT-9). INT-6 told that because she gets a little bit confused sometimes, the tool was not completely intuitive for her, however she was using it and it worked out for her.

Other users refer some aspects that demand some initial effort when starting to use the tool. Or because the user was not really familiarized in working with this kind of tools - "*I didn't know how to use it, because one of my colleagues (...) he was posting a lot of pictures and asking me to share, I couldn't know how I putted it, or how I use it, I sent him a message in the beginning, but I got to the information how to use it, the application guidance and then, ok, I got to know how to interact with it*" (INT-1) - or because Yammer can be perceived as another task the employee needs to execute - "*At the beginning of course, you have to do an effort because it is something extra to have to think about*" (INT-2), "*it is not a very difficult process, but basically I confess that, as any other new process, there was a period of interaction and process codification, if necessary*" (INT-3).

Users refer a small effort in the beginning "*but then it starts to be common, so it is not a real effort*" (INT-2). "there is always that complicated part until the users get used to it" (INT-3).

Proposition 9: Lower effort expectancy, which is related to an easy to use and user-friendly platform, will positively influence Yammer use

j) CAT-10: Platform integration

Table 21: Codes from the category Platform integration

Code ID	Code	Code count	Interviews (%)	Support
COD-101	Integration with other platforms	1	8,3%	INT-12

A user refers that the integration of Yammer with other Office 365 applications seems to be a facilitating condition: "*it is connected to the other platforms like SharePoint, outlook, so it is somehow similar with them, and people can compare, and can perceive it like a part of communication*" (INT-12).

Because this topic was only referred by one interviewee, the evidence didn't seem to be relevant enough for a proposition to be made.

k) CAT-11: Social Environment

Table 22: Codes from the category Social environment

Code ID	Code	Code count	Interviews (%)	Support
COD-111	Management support	6	41,7%	INT-2; INT-6; INT-7; INT-9; INT-10
COD-112	Peers feedback	5	41,7%	INT-1; INT-2; INT-3; INT-4; INT-7
COD-113	Social influence	6	41,7%	INT-3; INT-4; INT-8; INT-9: INT-12
COD-114	People pushing	7	58,3%	INT-1; INT-2; INT-4; INT-6; INT-7; INT-9; INT-11

The social environment is one of the most important factors influencing interviewees to use Yammer. Users seem to search for their peers' feedback, that is, friends and colleagues, when they are evaluating the tool: "*I talked a bit with my friends to see if they were using it or not*" (INT-2), "*Then, it was also through the contact with my colleagues*" (INT-3), "*I would say it came more from my team and the people I work with in my project*" (INT-4). This same employee adds, in another part of the interview, that "*if it would be that no body from my team, for example, would be posting on Yammer, or would be commenting on Yammer, then I would feel like "why?" or "Am I allowed to?""*. Thus, the surrounding social environment can act as an example of the expected social behaviour. This idea is also supported

by another interviewee: "*Because it is the tendency that my colleagues don't really post anything on Yammer, so maybe that's fine that I don't post anything or so.*" (INT-8).

Proposition 11a: Higher peer support will positively influence Yammer use

Support from managers is also important. INT-9 agrees that having line managers and peers using Yammer was a factor pushing him forward to use Yammer: "*Yes, definitely*". INT-6 has the same opinion, although not in the same degree of certainty when asked about the influence of managers' presence in Yammer: "*I don't know, I think I would use it more.*". In Ireland, one of the most successful countries when it comes to the percentage of Yammer usage, the "*general manager would post business updates, so quarterly or monthly, she posts business updates and you can get relevant information on what everybody is doing and how MO Ireland is doing from a results point of view.*" (INT-7). Another interviewee suggests that a good approach when introducing Yammer would be "*to share with the ASM, the area sales managers, and then on a regional sales meeting, introduce it there*" (INT-10). All these examples express the importance of having management leaders showing the example and supporting Yammer initiatives.

Proposition 11b: Higher management support will positively influence Yammer use

Having someone encouraging and supporting people to start using Yammer also seems to be an effective approach - "*also guiding my team and creating groups. Also asking them about if they are sharing, what's the issue, why are you not using Yammer? (...) let's go on Yammer, much better because everyone in the team is over there now, so I really encourage the team to use it because i like it.*" (INT-1), "*they would put up certain posts and they would encourage people to do the same.*" (INT-7), "*we try to push the sales agents for example to post their success or ..., we push right now for the onTrack stories that every contract or analysis is posted on Yammer as well. So, globally there are lots of people pushing.*" (INT-2).

INT-12 says: "*I believe people in Russia will use it if they see the trend of usage.*".

Even though these more generic aspects regarding an unspecific social influence are also important, however they are already covered by aspects as Critical Mass or Utilization Guidance.

l) CAT-12: Noise

Table 23: Codes from the category Noise

Code ID	Code	Code count	Interviews (%)	Support
COD-121	Dispersion of information	5	25%	INT-3; INT-10; INT-11
COD-122	Technology overlapping	16	50%	INT-4; INT-5; INT-6; INT-10; INT-11; INT-12

A recurring topic on the interviews is related with the problem of technology overlapping. To the interviewee INT-5, Yammer is "*One more platform to communicate. I already have enough of them.*" and he also adds that "*there are too many SharePoint sites. Only me, I have twenty I must pay attention to (...) Yammer is another parasite in the middle. I think there are too many things...*". The same individual also enhances the importance of looking for a need when introducing a new platform, he identifies several overlapping aspects between Yammer and SharePoint, email and Skype, being Yammer less effective on his perspective. INT-11 also expresses the need to understand the advantage of Yammer in an overlapping scenario: "*what are the differences with the other platforms that are also sharing information like SharePoint, and all that?*". INT-5 concludes by saying that "everything depends of the platform people started to use first".

The existence of different tools used to communicate and exchange information leads to a scenario of dispersion of information. INT-3 stats that "*today, I start to struggle a little bit to keep up with all the information that spreads through Yammer*", comparing it with SharePoint where "*everyone injects information, but, then, to find it gets complicated*". INT-5 criticizes the amount of information sources by saying: "*Why should I have four or five mail boxes at home? I just have one.*".

This reality forces users to prioritize the information they pay attention to, mainly when they complain about having too busy work routines: "*So I turned it off, so I don't receive any emails from Yammer now and that makes it, at third hand choice. My first hand is, off course, my normal email, communication with costumers. The second one is my OneDrive, my SharePoint, that I use a lot. And, then, the final ones are our social network platforms*" (INT-10). The need to clarify the placement of Yammer in the technological and organisational landscape makes him to add that Yammer should be "*a tool and not another thing competing for our time*".

Proposition 12: Noise, or more specifically, the existence of a multitude of information sources and communications platforms, will negatively influence the use and the expect value on using Yammer

m) CAT-13: Organizational culture

Table 24: Codes from the category Organizational culture

Code ID	Code	Code count	Interviews (%)	Support
COD-131	Organizational culture	2	16,7%	INT-9; INT-12

INT-9 refers Yammer "*obviously became an understanding that it was something that was an instrument to our culture.*" because his peers and managers were using Yammer when he started at LSA. The platform was used during the introduction training to the company as a tool to upload assignments. This user started to work in the company when Yammer was already introduced, what made things easier because it was something related to the organisation culture, on his perspective. However, that also highlights the importance of change management to all "before-Yammer" employees. Because they were used to work in a specific way and to use specific tools, Yammer appears as a mindset in the organisational way of communicating and working. "*it is really challenging because people now live without it mostly*" (INT-12).

Because this topic was only referred by two interviewees in two specific moments and the topic of utilization guidance and usage incentives already cover in some extent the organizational support to Yammer, the evidence didn't seem to be enough to develop a proposition.

n) CAT-14: Individual

Table 25: Codes from the category Individual

Code ID	Code	Code count	Interviews (%)	Support
COD-141	Time	10	33,3%	INT-4; INT-8; INT-10; INT-12
COD-142	Language Knowledge	3	16,7%	INT-4; INT-12
COD-143	Confidence	4	25%	INT-2; INT-4; INT-6
COD-144	Prioritization	8	25%	INT-8; INT-9; INT-10

Individuals also addressed the issue of lack time, which is decisive when users feel they are being bombarded with information - "*as an account manager, with limited time, you have to focus, you don't have the office hours, you don't have the 1,2,3 hours in front of the computer, you don't... Maybe*

you have 30 mins in the day that should be used very very wisely focused", "*I was driving as an account manager in Copenhagen, there was an extreme level of business and "busyness", I was very busy*". (INT-10). "*we have lots of platforms for business, for social networking and so on, so not all the people have time to go there*" (INT-12).

Another interviewee, INT-8, starts by blaming the lack of time to not using Yammer, however, she rapidly changes her speech expressing that Yammer is not a priority for her "*Yeah, mostly because I don't have time to look to Yammer. Maybe it is not, I don't put it as a priority. (...) I know there is a lot of interesting groups and interesting discussions there. It is just that, I don't put it as a priority to.... Maybe once a week I go through Yammer*."

Proposition 14a: Lack of time will negatively influence Yammer use

INT-12 and INT-4 express the idea that users need time to use Yammer and refer the topic of the language on Yammer. If INT-12 expresses the concern that users need specific skills to use Yammer because, even though the local language can be used in local groups, Yammer is an "*English speaking atmosphere, and in Russia not every sales agent or even our area sales managers have a level to speak or to communicate in English*", INT-4 says she is not really convinced about how effective the translation option is when people say "*language is not a problem, but you can post in your own language and then there is the translate button*".

Proposition 14b: Lack of language knowledge will negatively influence Yammer use

INT-4 and INT-6 clearly express they don't feel confident when it comes to participate more in Yammer. This lack of confidence comes from the fact they feel they don't have enough knowledge about the company or the business: "*I think it is related to the fact I don't have a lot of knowledge about the company. I still feel a little bit shy to do comments (...) Due to a lack of business or tools knowledge, I end up not to comment about that type of topics*." (INT-6). On the other side, Yammer is still considered a serious environment where everyone can judge what a user posts: "*somehow eliminating the step to post something or maybe just me because I see I don't have the authority. If I post something stupid then people will consider me stupid (...)".* This same Yammer user recommends a more informal environment, but still professional, where users can feel confident to post more about their work routines, to post "*small news you could share, and then maybe someone will benefit from it a bit.*".

Proposition 14c: Lack of confidence will negatively influence Yammer use

o) CAT-15: Technological Background

Table 26: Codes from the category Technological background

Code ID	Code	Code count	Interviews (%)	Support
COD-151	Technological experience	8	58,3%	INT-1; INT-2; INT-4; INT-6; INT-7; INT-11; INT-12
COD-152	Technological education/knowledge	9	50%	INT-3; INT-4; INT-6; INT-9; INT-10; INT-11

The similarities with other social media platforms like Facebook seems to be a facilitating factor when it comes to use Yammer: "*If you know how to use other platforms as this, it is easy.*" (INT-4), however "*some other people who are not so used to using social platforms or anything. So, they were not as positive to what Yammer has.*" (INT-4).

Proposition 15a: Experience using similar platforms will positively influence Yammer use

Another employee, INT-3, enhances the role of technological education when using Yammer "*I think it depends on the department. If it is an internal department with more technical people, with a different professional education, I think they can better adapt and take the most out of it. If we are speaking about the sales department and the sales teams, for them it is more complicated every time a new update, a new software comes...*".

People's technological culture may also be significant to measure the effort to use such kind of technologies. "*Denmark is a country very online minded, we use a lot of shopping online, and when we are at home, we use a lot of time on social networks*" (INT-10). "*see that why finish people would be very active on because I think there are a lot of...we are always somehow connected.*" (INT-4).

Proposition 15b: Higher technological expertise will positively influence Yammer use

p) CAT-16: Performance

Table 27: Codes from the category Platform management

Code ID	Code	Code count	Interviews (%)	Support
COD-161	Performance	14	91,7%	INT-1; INT-2; INT-3; INT-4; INT-5; INT-6; INT-7; INT-8; INT-9; INT-10; INT-11; INT-12

Performance expectancy is the strongest predictor of the intention to use a technology in UTAUT model, however, from the interviews, individuals don't seem to make a direct relation between performance and their experience in using Yammer. In a broader mode, they speak about the benefits they get by using Yammer as the improvements in communication or collaboration.

That way, to understand this relation, they were asked directly if Yammer influenced their performance. Individuals who had a positive perception about Yammer answered in a positive way by expressing the role of Yammer as a mean to access information or to get to know people. However, some users also rejected that idea because they don't see Yammer as a tool directly related to the execution of work tasks. In other words, tasks they related to performance or productivity.

Therefore, any proposition regarding performance was developed, but at some extent, this topic is also addressed by Value expectancy category.

q) CAT-17: Value expectancy

Table 28: Codes from the category Value expectancy

Code ID	Code	Code count	Interviews (%)	Support
COD-171	Benefits expectancy	8	41,7%	INT-4; INT-5; INT-8; INT-11; INT-12
COD-172	Utility expectancy	22	58,3%	INT-5; INT-6; INT-7; INT-8; INT10; INT-11; INT-12

From the interviews, it was possible to understand users need to feel they will have some return by using Yammer. The value expectancy seems to be very important when using Yammer, however, a clear understanding of Yammer goals and its way of usage is highly important for that. Users shall perceive the benefits they get by using the tool and how useful it will be. INT-12 expresses the benefit of a Yammer group solving organizational problems "*I guess this group will help us to solve many problems that are connected with collaboration between departments.*" On the other side, INT-5, when comparing Yammer

and email, says: "*So, I don't see in which extent I would get any advantages by going to Yammer*". Clearly, he doesn't see the benefit on using Yammer because he prefers to use email to communicate.

INT-6 expresses how Yammer is useful for her job, even though she sees higher applicability to field teams. INT-8 uses Yammer in a limited way as she only uses it to share employee events. However, when asked about her potential interest in a Human Resources group, she answer: "*I do have interest about specific topics related to HR, I want to know what other MOs take on that subject*". The expected value, or the perceived return or gains seem to be important in using Yammer.

INT-1 describes the switching process from WhatsApp to Yammer of his sales team. One of the main reasons for the change was the privacy issue, because, when using WhatsApp, employees need to use their private phone number: "*most of colleagues here, they like WhatsApp, they are interested in WhatsApp because it is public, but some colleagues, or some friends, have the feeling that this is privacy and this is not for business*". Because of the switch, "*all team is there [Yammer], everyone can see it, everyone can have interactions, so they have already installed it on their mobile phones, and they started talking.*". The interviewee says that it is even friendlier than WhatsApp or SharePoint, which needs a "big hand-code".

In a scenario where Yammer functionalities are perceived as completely overlapping with pre-existent applications, the expected benefits from switching from an older tool to a new one are increasingly important. That's the opinion of INT-5. Even though he considers Yammer to be a little bit different from other tools, he considers it to have limitations on the way of communication, and because of that he doesn't see advantage of switching tools: "*I don't see any advantage of switching from one source to the other.*".

Proposition 17: The expected value of using Yammer will positively influence Yammer use

r) CAT-18: Value

Table 29: Codes from the category Value

Code ID	Code	Code count	Interviews (%)	Support
COD-181	Collaboration	4	25.0%	INT-1; INT-6; INT-12
COD-182	Communication	6	41.7%	INT-1; INT-3; INT-5; INT-7; INT-12
COD-183	Community feeling	9	41.7%	INT-1; INT-2; INT-4; INT-6; INT-7
COD-184	Different type of communication	5	25.0%	INT-1; INT-2; INT-3

COD-185	Get to know the company	4	25.0%	INT-2; INT-4; INT-6
COD-186	Global information	14	75.0%	INT-1; INT-2; INT-3; INT-4; INT-6; INT-7; INT-8; INT-9; INT-12
COD-187	Increase motivation	4	25.0%	INT-1; INT-3; INT-9
COD-188	Information	23	75.0%	INT-2; INT-3; INT-4; INT-5; INT-6; INT-7; INT-9; INT-11; INT-12
COD-189	Interaction with colleagues	2	8.3%	INT-1
COD-1810	Knowledge exchange	11	58.3%	INT-1; INT-3; INT-4; INT-6; INT-9; INT-11; INT-12
COD-1811	Local information	17	66.7%	INT-2; INT-3; INT-6; INT-7; INT-8; INT-9; INT-11; INT-12
COD-1812	Networking	6	33.3%	INT-1; INT-4; INT-7; INT-9
COD-1813	Recognition	4	33.3%	INT-2; INT-3; INT-4; INT-11
COD-1814	Sharing platform	12	50.0%	INT-1; INT-2; INT-3; INT-5; INT-7; INT-8
COD-1815	Success stories	15	58.3%	INT-1; INT-2; INT-3; INT-4; INT-5; INT-7; INT-9
COD-1816	Training	1	8.3%	INT-3

During the interviews, Interviewees have also expressed how Yammer is useful for them and for what do they use it. Some of the codes are more specific and related to specific actions as access local or global information. Other codes are more related to the feeling of community and the recognition users receive when they share success stories on the network.

It is possible to understand that one of the most supported use cases is related to share and access information. Indeed, Yammer seems to be very relevant in local organizations for that purpose because, as INT-7 says "*it is a challenge to share this information with everybody within [LSA] Ireland, so I think it is useful resource for that.*" Sharing success stories is also highly referred on the interviews. The feeling of recognition seems to be associated with it.

In the course of this section, it was possible to describe the categories and codes that arose from the interviews analysis, and to formulate a set of propositions that highlight the relations among them. Table 30 presents the final list of propositions.

Table 30: List of propositions

ID	Proposition
P1	A good platform management, by the enforcement of policies and an active role of managers, will positively impact platform content quality

ID	Proposition
P2a	Guidance and support regarding how to use Yammer and Yammer goals will positively impact users' platform understanding
P2b	The development of Yammer initiatives, or usage incentives, will positively impact Yammer use
P3	A good understanding of Yammer, more specifically, its goals and its ways of usage, will positively impact the expected value from using it
P4	A good content quality will positively influence the value expect of using Yammer
P5	High Platform communication immediacy will positively impact Yammer use
P6a	A professional environment where people interact in an informal way will positively affect Yammer use
P6b	An enjoyable environment will positively affect Yammer use
P6c	Perceiving Yammer as a working platform seems to impact Yammer use, however the polarity of the impact is not clear.
P7	A higher number of users will positively affect Yammer use
P8	Higher platform accessibility will positively influence Yammer use
P9	Lower effort expectancy, which is related to an easy to use and user-friendly platform, will positively influence Yammer use
P11a	Higher peer support will positively influence Yammer use
P11b	Higher management support will positively influence Yammer use
P12	Noise, or more specifically, the existence of a multitude of information sources and communications platforms, will negatively influence the use and the expect value on using Yammer
P14a	Lack of time will negatively influence Yammer use
P14b	Lack of language knowledge will negatively influence Yammer use
P14c	Lack of confidence will negatively influence Yammer use
P15a	Experience using similar platforms will positively influence Yammer use
P15b	Higher technological expertise will positively influence Yammer use
P17	The expected value of using Yammer will positively influence Yammer use

4.2.4.3 Qualitative model

As a final step of Phase 1, Figure 14 represents the qualitative model, that is a visual representation of the categories and propositions which emerged from the codding process and proposition formulation. In the model, the arrows represent the propositions - identified by ID – and the rectangles represent categories – identified by the respective Category description. The model only presents the categories which are linked by propositions. Categories are grouped in five categories to make the model more understandable:

- Situational aspects: aspects related to the technological and social environment of the organization;

- Individual aspects: aspects intimately related to the individual knowledge, personality and time to use Yammer;
- Platform climate quality: intrinsic aspects related to climate created by the way users use Yammer;
- Platform technical quality: aspects related to the technical quality of Yammer;
- Organizational active role: aspects related to the active role of the organization managing and introducing Yammer to employees.

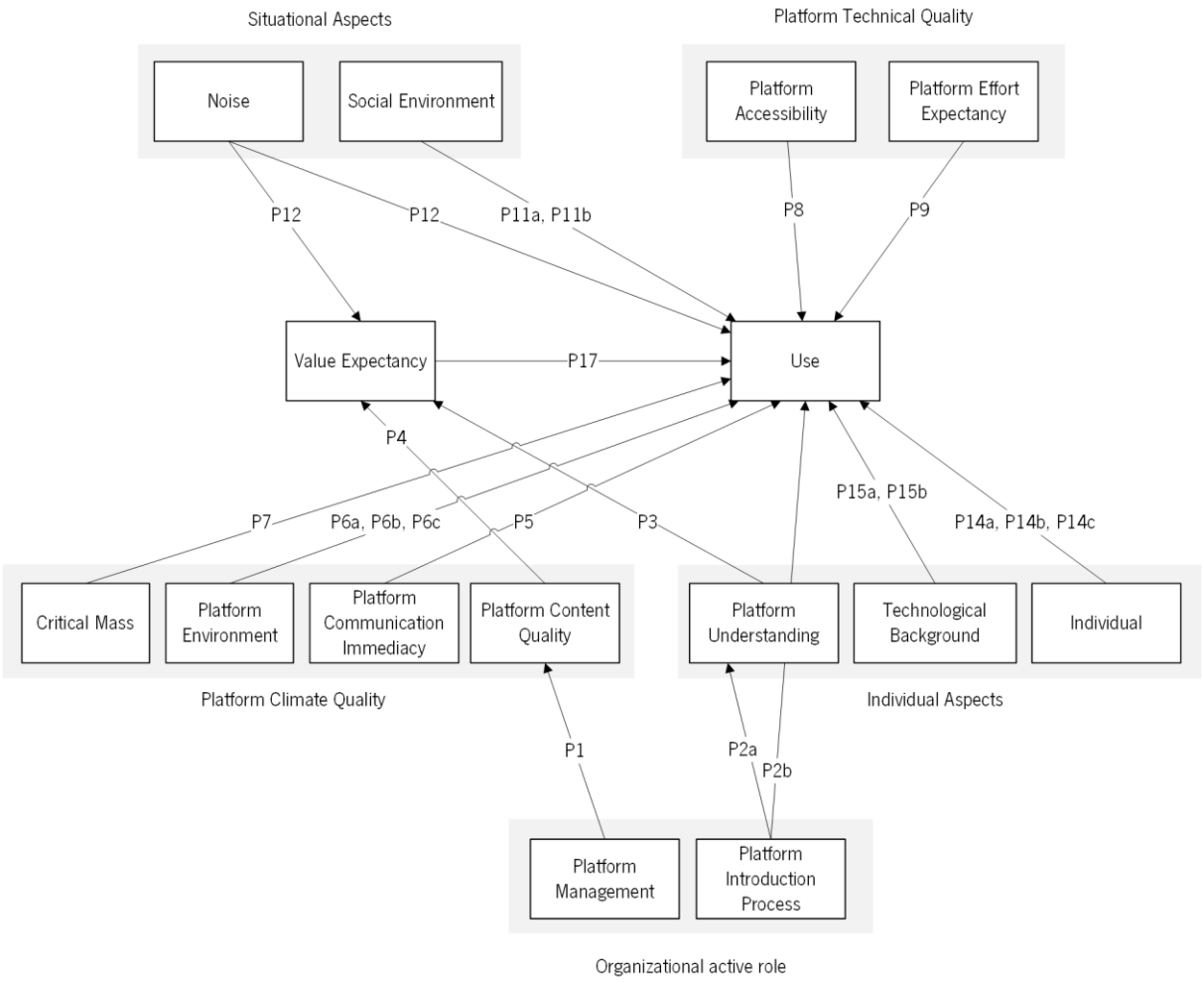


Figure 14: Qualitative model

This holistic overview allows to anticipate a potential important role of the organization, direct or indirect, increasing value expectancy and fostering the use of Yammer, through an active role on the management of the platform and on the introduction process of Yammer to the users. On the other hand, a set of factors related with the climate and technical quality of the platform, the environment of the

organization and the characteristics of the individual seem to influence the value expected of using Yammer and its usage as well.

However, these findings will only be tested in Phase 2, moment when precise conclusions will be made.

4.3 Phase 2

The previous phase had the objective to identify a set of factors that influence Yammer use and to develop a set of propositions that describe the relationship between those factors. This phase will be useful to collect evidence to support these initial findings in a broader level.

4.3.1 Research method

Phase 2 was based in a survey research. Survey research provides a quantitative or numeric description of trends, attitudes, or opinions of a population by studying a sample of that population with the intention to generalize from the sample to the population (Creswell, 2014).

Figure 15 shows in detail the way this survey research was conducted. At first, there was an operationalisation of concepts and propositions into variables and hypothesis, respectively, to adequate these units for the quantitative research. Then, a literature review was conducted to identify instruments, used before to measure the variables in analysis, that could potentially also be used in this questionnaire. Then, a set of items was developed based on the interview extracts from the 12 interviews conducted in the previous Phase 1, section 4.2. A scale was also developed considering a literature review conducted around the topic. The result was the initial instrument. Thereafter, a set of tests were conducted to identify issues in the instrument, to improve it and to ensure its validity. The result was the final instrument. In the end, it was time to conduct the full-scale survey. That comprises not only to make the questionnaire available, but also to describe sample techniques, the sample and response rates.

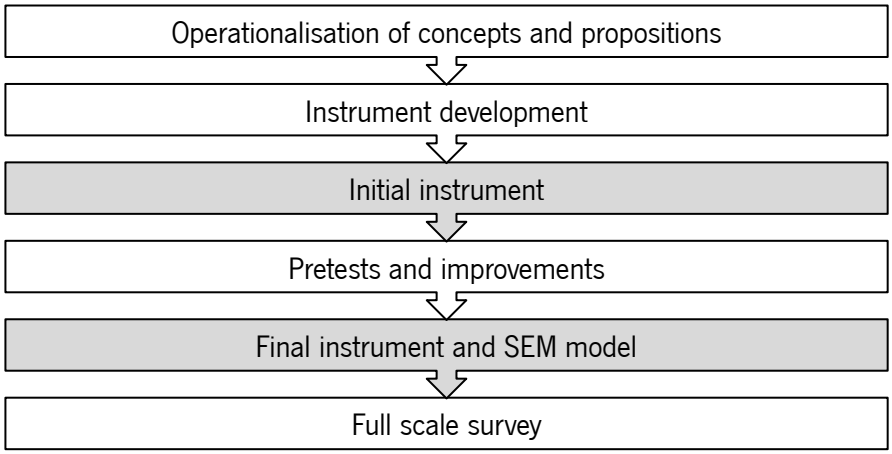


Figure 15: Survey conduction process

4.3.2 Data collection methods

Data collection will be conducted through an online questionnaire, made available in a SharePoint site using the tool provided by this platform for that purpose.

4.3.3 Data analysis methods

Questionnaire answers will be analysed applying structural equations modelling methods. SEM allows to model relationships among multiple variables and statistically test hypotheses with empirical data (W. W. Chin, 1998). Thereafter, it will be possible to identify which hypothesis are supported by data and which are the most relevant factors influencing Yammer use.

a) SEM

SEM is a statistical technique for testing and estimating causal relationships based on statistical data and qualitative causal assumptions (Urbach & Ahlemann, 2010), in other words, it allows to assess relationships between Latent Variables (LVs) - conceptual terms used to describe theoretical concepts or phenomena – and Observable Variables (OVs) – measures, indicators, or items that, unlike LVs, can be measured directly (Andreev, Heart, Maoz, & Pliskin, 2009).

According to W. W. Chin (1998), SEM techniques provided an advantage over first-generation techniques because they allow to:

- model relationships among multiple predictor and criterion variables;

- construct unobservable variables;
- model errors in measurement for observable variables;
- statistically test a priori substantive/theoretical and measurement assumptions against empirical data.

A structural equation model is formed by two sub-models. The structural model (inner model) is constituted by the relationships between the LVs. Because LVs can't be directly measured, for each LV there is a measurement model (outer model). These models are responsible for making the connection between empirical observable indicators, OVs, and LVs (Urbach & Ahlemann, 2010).

Figure 16 illustrates a simple SEM. The model consists of two endogenous LVs – dependent variables – and one exogenous LVs – independent variable. Exogenous LVs are the ones from which arrows are only emitted to other LVs. Exogenous LVs are denoted ξ_i and endogenous LVs are denoted η_i. OVs are represented by X_i if they are a measure of an exogenous variable or Y_i if they are a measure of an endogenous variable. The relationships between variables is quantified by path coefficients. Paths connecting OVs with LVs, λ_i, represent weights – in case of formative measures – or loadings – in case of reflective measures. Paths connecting exogenous LVs and endogenous LVs are identified by γ_i and the paths connecting two endogenous LVs are identified by β_i (Andreev et al., 2009; Urbach & Ahlemann, 2010).

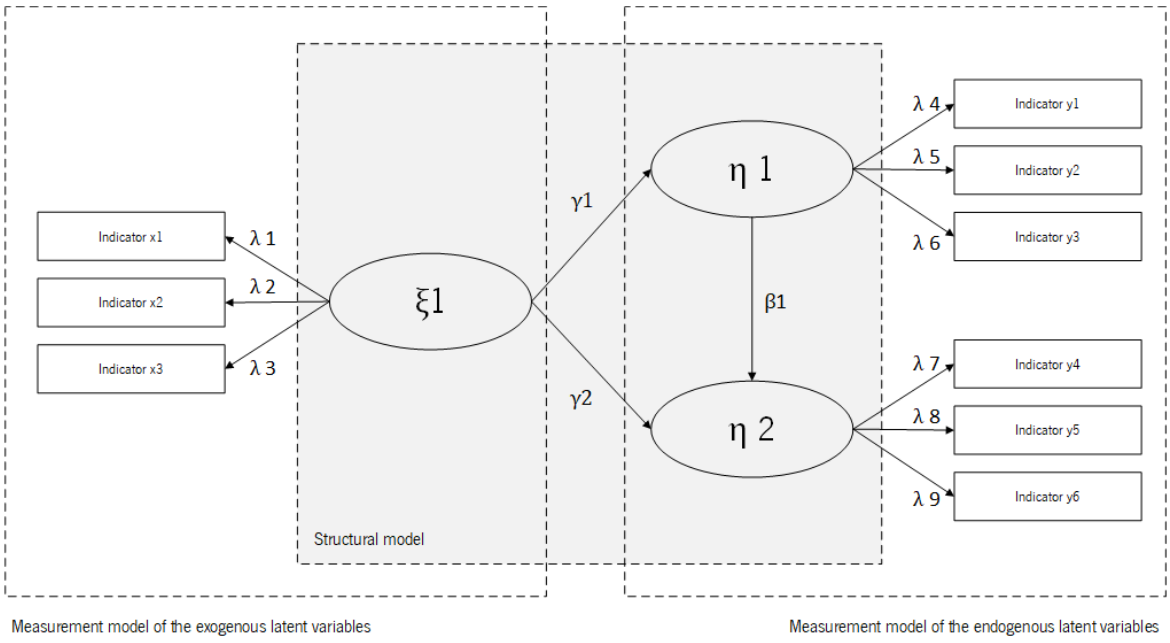


Figure 16: Example SEM model
Adapted from Backhaus et al. (2000)

As stated before, LVs can be measured either by formative or reflective measurement models. In formative measurement models, the measures cause or form the LVs (W. W. Chin, 1998). Basically, they reflect the conditions under which the LV is realized (Urbach & Ahlemann, 2010). In other words, each item measures a different and essential aspect of the LV, which means they don't need to be correlated or to have high internal consistency (W. W. Chin, 1998). On the other hand side, in reflective measurement models, the measures are affected by the same underlying concept (W. W. Chin, 1998), so all the items measure the same phenomena (Urbach & Ahlemann, 2010).

Table 31 shows a comparison between the two measurement models.

Table 31: Comparison between reflective and formative measurement models

Criteria	Formative Model	Reflective Model
Direction of causality	From items to constructs (OVs to LVs)	From constructs to items (LVs to OVs)
Interchangeability of items	Indicators can't be interchangeable	Indicators should be interchangeable
Covariation of items	Indicators don't necessarily need to covary with each other	Indicators are expected to covary with each other
Nomological net of the items	May differ	Shouldn't differ

There are two types of SEM methods. The first one, covariance-based (CovSEM), "attempts to calculate model parameters that will minimize the difference between the calculated and observed covariance matrices, yielding goodness of fit indices as a result of the magnitude of the differences". The second one, component-based, also known as Partial Least Squares (PLS), "attempts to estimate all model parameters in such a way that the result should be a minimized residual variance of all dependent variables and observed variables, namely, maximize the explained variance". While PLS is mainly used for prediction purposes, CovSEM, focus on parameter estimation to obtain a good fit for the data (Andreev et al., 2009).

In a study that analysed all the research articles published between 1994 and 2008, in the journals Information Systems Research and Management Information Systems Quarterly, 78 articles used PLS for statistical analysis. In these studies, researchers argue they used this technique because PLS isn't so demanding regarding sample size as other methods, it doesn't require normal-distributed data and it can be applied to complex SEM with large number of constructs. PLS is also able to handle reflective and formative constructs, is better suited for theory development than theory testing and especially useful

for prediction (Urbach & Ahlemann, 2010). For these reasons, PLS will be the SEM method used to analyse results in this study.

4.3.4 Operationalisation of concepts and propositions

The categories and codes from qualitative research – Phase 1 – are clearly defined in Table 11, and, thereby, they can be seen as concepts that "represent various aspects of the reality", however, the correspondence between the theorized reality and the actual reality needs to be evaluated (Misra & Pawar, 2014) - Phase 2. Variables are the manifestation of concepts in the empirical world, therefore, they make it possible to assess the manifestation of concepts through the use of instruments (Misra & Pawar, 2014). Typically concepts and variables carry the same name and definitions (Misra & Pawar, 2014).

Following this line of though, the categories and codes identified in Phase 1 that are relevant for Phase 2 will be operationalized into variables, see Figure 17. Relevant categories and codes are considered to be the ones that are linked to other categories and codes by the formulation of propositions. Then, variables will be measured using an instrument, developed in section 4.3.5.

Figure 17: Operationalization of concepts into variables

Table 32 presents the initial list of variables, that resulted from the operationalization of concepts (categories and codes), and the respective definitions. The categories or codes behind the variables are identified by the respective ID. Variable Use was created because the final purpose is to explain use.

Table 32: Initial list of variables and definitions

Variable	Variable definition	Code ID or Category ID
Manager	Extent to which users perceive that Yammer is being well managed	COD-11
Policies	Extent to which users perceive the existence of Yammer policies	COD-12
Utilization guidance	Extent to which users perceive they were supported when they started to use Yammer	COD-21
Usage incentives	Extent to which users perceive the organization developed initiatives on Yammer to engage users with the platform	COD-22
Objectives	Extent to which users understand Yammer objectives	COD-31
Usage information	Extent to which users understand how to use Yammer	COD-32
Content quality	Extent to which users perceive that Yammer has content quality	CAT-4
Communication immediacy	"extent to which a collaboration technology enables the user to quickly communicate with others" (Brown et al., 2010)	CAT-5
Enjoyment	Extent to which users perceive that Yammer environment is enjoyable	COD-61
Working feeling	Extent to which users perceive that Yammer is a platform used to work	COD-62
Informal interaction	Extent to which users perceive that Yammer way of interaction is informal	COD-63
Professional environment	Extent to which users perceive that Yammer environment is professional	COD-64
Critical Mass	"point where enough users have adopted an innovation so that there is an acceleration of adoption of the innovation where upon it becomes self-sustaining" (Sledgianowski & Kulviwat, 2009)	CAT-7
Platform accessibility	Degree of ease associated with the access to Yammer	CAT-8
Effort expectancy	"degree of ease associated with the use of the system" (Venkatesh et al., 2003)	CAT-9
Management support	Extent to which users perceive that management supports Yammer usage	COD-111
Peers feedback	Extent to which users perceive that their peers support Yammer usage	COD-112
Noise	Existence of a "significant set of software applications available to perform their activities, a multitude of communication channels" and "an increased information overflow". (Bullinger et al., 2011)	CAT-12
Time	Extent to which users perceive they don't have time to use Yammer	COD-141
Language knowledge	Extent to which users perceive they don't have the language knowledge to use Yammer	COD-142
Confidence	Users confidence on using Yammer	COD-143

Variable	Variable definition	Code ID or Category ID
Technological experience	Users technological experience	COD-151
Value expectancy	Extent to which users perceive Yammer as being a useful tool from which they can benefit if they use it	CAT-17
Use	Extent to which users use Yammer	-

Adding to this, there is the need to operationalize the propositions, formulated during Phase 1, into hypothesis, so that they can be tested. According to Misra & Pawar (2014), propositions and hypothesis represent, respectively, relationships between concepts and relationships between variables. Therefore, a hypothesis is "an empirically verifiable implication of a proposition" and can be derived from a proposition by replacing concepts by variables.

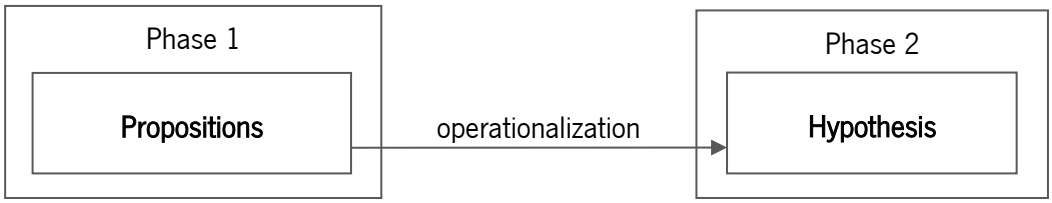


Figure 18: Operationalization of propositions into hypothesis

Through the conduction of a survey and analysis of questionnaire results, hypothesis will be tested and it will be possible to identify which are the strongest factors influencing Yammer use in the organization. Table 33 shows the list of hypotheses that resulted from the operationalization of propositions, both hypothesis and propositions are identified by the respective ID.

Table 33: List of hypotheses

ID	Hypothesis	Proposition ID
H1a	Better platform management will positively impact Content quality.	P1
H1b	Policies enforcement will positively impact Content quality.	P1
H2a	Utilization guidance will positively impact Utilization information	P2a
H2b	Utilization guidance will positively impact Objectives understanding	P2a
H2c	Usage incentives will positively impact Use	P2b
H3a	Understanding of platform objectives will positively impact Value Expectancy	P3
H3b	Utilization knowledge will positively impact Value Expectancy	P3
H4	Content quality will positively influence Value Expectancy	P4
H5	Communication immediacy will positively impact Yammer use	P5

ID	Hypothesis	Proposition ID
H6a	A professional environment will positively impact Use	P6a
H6b	An Informal interaction will positively impact Use	P6a
H6c	Enjoyment will positively impact Use	P6b
H6d	Perceiving Yammer as a working platform will impact Use	P6c
H7	Critical mass will positively impact Use	P7
H8	Platform accessibility will positively impact Use	P8
H9	Lower effort expectancy will positively impact Use	P9
H11a	Peer support will positively impact Use	P11a
H11b	Management support will positively impact Use	P11b
H12a	Noise will negatively impact Value Expectancy	P12
H12b	Noise will negatively impact Use	P2
H14a	Lack of time will negatively impact Use	P14a
H14b	Language knowledge will positively impact Use	P14b
H14c	Confidence will positively impact Use	P14c
H15a	Technology experience will positively impact Use	P15a and P15b
H17	Value expectancy will positively impact Use	P16

4.3.4.1 Structural Model

Figure 19 presents the initial structural model that is a representation of the variables, see Table 32, and hypothesis, see Table 33, developed previously. After instrument development, in section 4.3.5, it would be possible to develop a complete SEM model, both with the structural and measurement models.

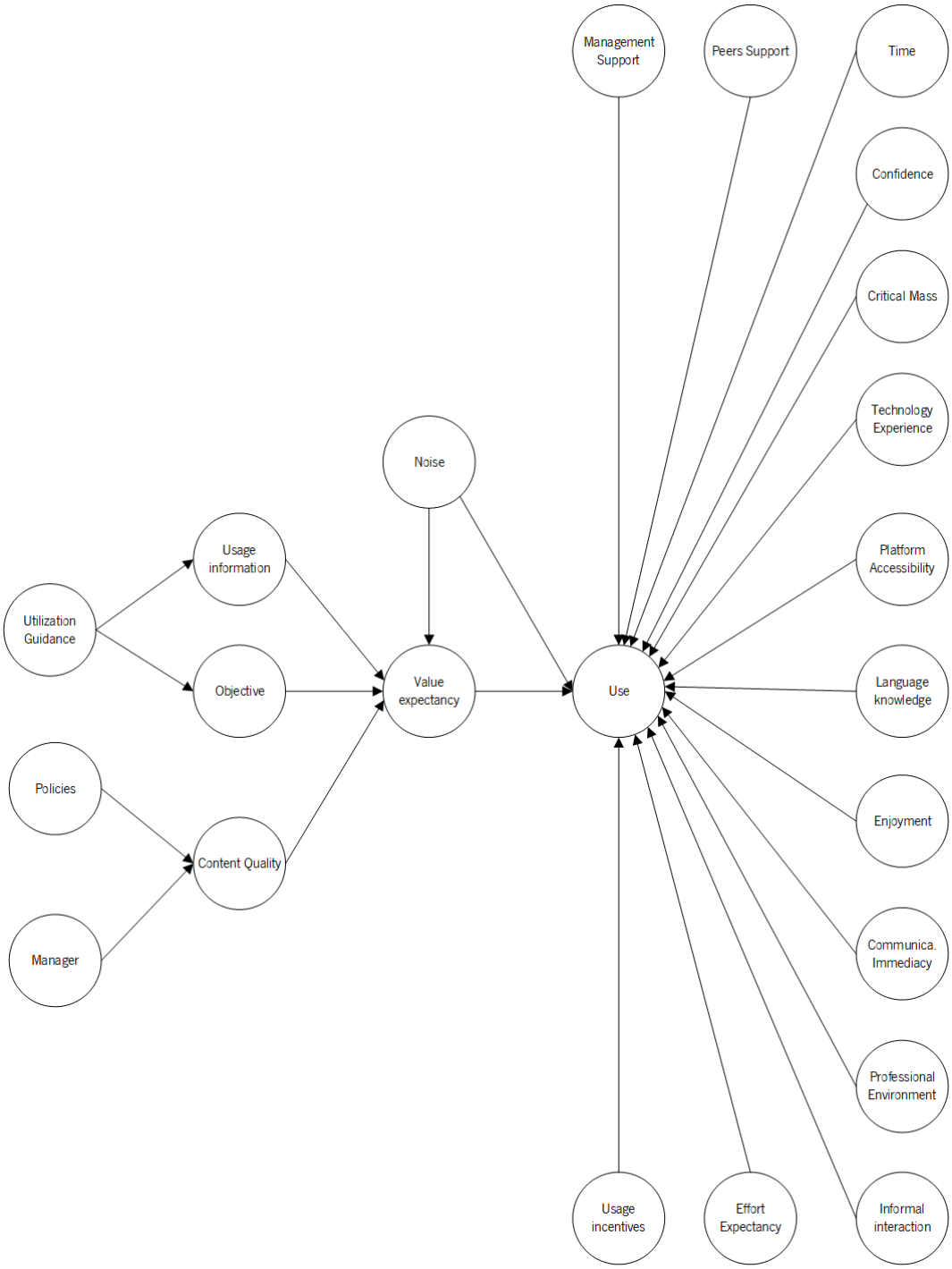


Figure 19: Initial structural model

4.3.5 Instrument development

As described previously, in this survey research there was the need to develop the survey instrument in order to measure the variables in study. Hinkin (1995) identified three major stages for instrument development in the context of a literature review of 75 articles published between 1989 and

1993: Item Generation, Scale Development and Scale Evaluation. Item generation focuses in developing a set of items. Scale development focuses in grouping those items in blocks and in developing the scales in which respondents will rate them. At last, Scale evaluation ensures the validity of the scale.

However, before undertaking in the phase Item Generation, there was the concern to search in the literature for instruments that have already been used in the past to measure the same or similar variables from the ones in study in this research initiative. Those instruments were adapted every time it was possible.

Figure 20 represents the instrument development process followed in this study. It is important to highlight the fact that the grouping of items in blocks won't be performed in Scale development stage. Instead, it will be performed in Item generation stage. Therefore, in opposition to Hinkin (1995), the term "scale" won't be used with the meaning of "instrument", but just as a reference to the scale (in this study, a Likert-scale) used to measure the items. Consequently, "Scale evaluation" stage will be renamed "Instrument evaluation" and "Scale development" stage refers only to the process of developing the Likert-scale used in the study. These stages will be further described in the next sections.

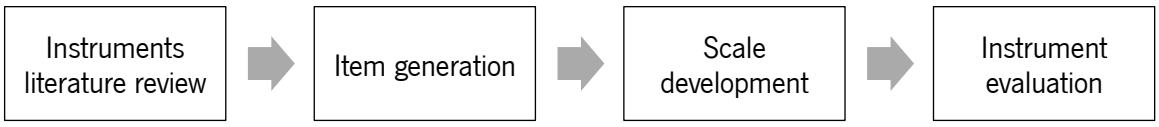


Figure 20: Instrument development process

4.3.5.1 Instruments literature review

The first step to develop an instrument, that could be used to measure the variables in study, was to search in the existent literature for instruments that have been used in the past for measuring the same or similar variables. Following that strategy, nine sets of items were found to measure the following variables: Effort expectancy, Enjoyment, Communication immediacy, Platform integration, Technological experience, Management support, Peers feedback, Critical Mass and Use.

Even though pre-existent items can be helpful, they shall be analysed before being adopted or adapted in order to understand if they are aligned with the target they should measure (Beglar & Nemoto, 2014).

a) Effort expectancy

Effort expectancy is a concept proposed by Venkatesh et al. (2003) based in three constructs from previous models: perceived ease of use (TAM/TAM2), complexity (MPCU) and ease of use (IDT). Brown et al. (2010), in the context of the study of adoption and use of collaboration technology, measured this same variable using scales adapted from Davis et al. (2003) and Venkatesh et al. (2003). For this instrument, the items, see Table 34, were re-formulated in order to change the verbal tense from future to present because the tool was introduced three years ago and around 20 000 employees have at least contacted with the tool once.

Table 34: Items adapted for Platform effort expectancy

Variable	Items	Original Items
Effort expectancy	Using Yammer doesn't require a lot of mental effort; I think Yammer is easy to use; Using Yammer is easy for me.	Using <collaboration tool> will not require a lot of mental effort; I believe <collaboration tool> will be easy to use; Using <collaboration tool> will be easy for me.

b) Enjoyment

In the context of the study of blog usage, Hsu & Lin (2008) proposed perceived enjoyment to have a positive effect on the attitude towards using blogs as "the interacting process yields fun and enjoyment". The items used to measure enjoyment can be seen in Table 35. The first two items achieved reliabilities higher than 0.90 and a composite reliability of 0.92. The third item was removed in that research study to obtain a better fit to the proposed model.

Table 35: Items adapted for Enjoyment

Variable	Items	Original Items
Enjoyment	While participating in Yammer I experience pleasure; The process of participating in Yammer is enjoyable; I have fun using Yammer.	While participating in blogs I experienced pleasure; The process of participating in blogs is enjoyable; I have fun using blogs.

c) Communication immediacy

Brown et al. (2010) propose Communication immediacy to influence Performance expectancy. The items used to measure this variable, see Table 36, were developed because no scales were available from previous literature. The items were developed following standard procedures for scale development and went through peer feedback and card sorting to attest their validity.

Table 36: Items adapted for Platform communication immediacy

Variable	Items	Original Items
Communication Immediacy	Yammer enables me to quickly reach communication partners; When I communicate with someone using Yammer, they usually respond quickly; When someone communicates with me using Yammer, I try to respond immediately.	<Collaboration tool> enables me to quickly reach communication partners; When I communicate with someone using <collaboration tool>, they usually respond quickly; When someone communicates with me using <collaboration tool>, I try to respond immediately.

d) Technological experience

Brown et al. (2010) also developed the items to measure Technological experience following the same protocol as described in c). The items were adapted in order to address aspects related to social networks. Therefore, the terms "audioconferencing" and "videoconferencing" were replaced by "social networks" and "social media", see Table 37.

Table 37: Items adapted for Technological experience

Variable	Items	Original Items
Technological experience	My experience with social networks is: None at all . . . Very extensive; My experience with social media is: None at all . . . Very extensive; My experience with messaging tools (e.g., MSN messenger) is: None at all . . . Very extensive; My experience with technologies similar to Yammer is: None at all . . . Very extensive.	My experience with audioconferencing is: None at all . . . Very extensive; My experience with videoconferencing is: None at all . . . Very extensive; My experience with messaging tools (e.g., MSN messenger) is: None at all . . . Very Extensive; My experience with technologies similar to <collaboration tool> is: None at all . . . Very extensive.

e) Management support

The instrument for Management support was adapted from items used to measure Superior influence from Brown et al. (2010), see Table 38. The third item "There is the pressure from organization to use Yammer" was excluded because it doesn't fit in the meaning of the variable.

Table 38: Items adapted for Management support

Variable	Items	Original Items
Management support	I believe the top management would like me to use Yammer; My supervisor suggests that I use Yammer;	I believe the top management would like me to use <collaboration technology>; My supervisor suggests that I use <collaboration technology>; There is the pressure from organization to use <collaboration technology>;

f) Peers feedback

The instrument for Peers feedback was adapted from items used to measure Peer influence from Brown et al. (2010), see Table 39.

Table 39: Items adapted for Peers feedback

Variable	Items	Original Items
Peers feedback	My friends think I should use Yammer; My peers think I should use Yammer; My co-worker think I should use Yammer.	My friends think I should use <collaboration technology>; My peers think I should use <collaboration technology>; My co-worker think I should use <collaboration technology>.

g) Critical Mass

Sledgianowski & Kulviwat (2009) studied the effects of playfulness, critical mass and trust in the use of social network sites. The instrument used for measuring critical mass was adapted from Hart, M. and Porter, G., "The Impact of Cognitive and Other Factors on the Perceived Usefulness of OLAP". The items achieved loadings of 0.70 or higher, construct reliability of 0.82 and Cronbach's Alphas of

0.88. Even though the idea is to have verbal tenses in the present, in this case, the items were not changed because, by changing them, the items would become very similar, see Table 40.

Table 40: Items adapted for Critical mass

Variable	Items	Original Items
Critical mass	Many people I communicate with use Yammer; The people I communicate with will continue to use Yammer in the future; The people I communicate with using Yammer will continue to use Yammer in the future; Of the people I communicate with regularly, many use Yammer.	Many people I communicate with use this website; The people I communicate with will continue to use this website in the future; The people I communicate with using this website will continue to use this website in the future; Of the people I communicate with regularly, many use this website.

h) Use

Brown et al. (2010) used a measure for Use that examined use in the dimensions intensity, frequency, duration and choice. In the context of the adoption of a SMS technology, the item "Of the opportunities you have to use collaboration tools, including a telephone, what percentage of time do you choose <collaboration tool>?" was used to measure the dimension choice. Because Yammer is a very specific technology that is not easily replaceable by other collaboration tools in the company, using that item would confuse users. The strategy was not to measure the dimension choice in use. Table 41 presents the items adopted.

Table 41: Items adapted for Use

Variable	Items	Original Items
Use	I rate my intensity of use of Yammer to be: Very light . . . Very heavy; How frequently do you use Yammer: Never . . . Very frequently; On an average week, how much time (in hours) do you use Yammer?.	I rate my intensity of use of <collaboration tool> to be: Very light . . . Very heavy; How frequently do you use <collaboration tool>: Never . . . Very frequently; On an average week, how much time (in hours) do you use <collaboration tool>?; Of the opportunities you have to use collaboration tools, including a telephone, what percentage of time do you choose <collaboration tool>?.

i) Other items adapted from the literature

Table 42 presents a set of items that were also adopted initially for the instrument to measure different variables.

Table 42: Items adapted for several other variables

Variable	Items	Original items	Source
Usage Incentives	There was the pressure from organization to use Yammer.	There was the pressure from organization to use Yammer.	Brown, Dennis, & Venkatesh (2010)
Utilization Guidance	A specific person (or group) was/is available for assistance with difficulties with Yammer.	A specific person (or group) is available for assistance with difficulties with Yammer.	Brown et al. (2010)
Content Quality	The content Yammer is useful; The content of Yammer is clear; Yammer looks organized; The content of Yammer is current.	The content of _____'s web site is useful; The content of _____'s web site is clear; _____'s web site looks organized; The content of _____'s web site is current.	Aladwani & Palvia (2002)
Informal interaction	I feel comfortable using informal communication (such as slang or abbreviations) with co-workers with whom I collaborate.	I feel comfortable using informal communication (such as slang or abbreviations) with co-workers with whom I collaborate.	Brown et al. (2010)
Confidence	I feel apprehensive about using Yammer; Yammer is somewhat intimidating me.	I feel apprehensive about using the system; The system is somewhat intimidating me.	Venkatesh et al. (2003)
Language knowledge	I have the necessary language knowledge to use Yammer.	I have the knowledge necessary to use the system.	Venkatesh et al. (2003)
Platform accessibility	Yammer is easy to access.	_____'s web site is easy to access (i.e. has a reflective and widely registered name).	Aladwani & Palvia (2002)
	There isn't sufficient access to use Yammer; I am not able to use Yammer when I need it.	There isn't sufficient access to use <collaboration technology>; I am not able to use <collaboration technology> when I need it.	Brown et al., (2010)

4.3.5.2 Item generation

There are two approaches for item generation: deductive and inductive. Deductive item development is highly supported by the literature and requires an understanding of the phenomena in order to develop the conceptual background of the concepts studied. Items are then developed based on theoretical definitions, usually by the researchers or experts on the topic. In an inductive approach, items are usually developed based on individuals' responses with limited resort on literature (Hinkin, 1995).

As the constructs were developed based on the previous qualitative phase, an inductive approach for item development was followed. As described earlier, the first step, before Item generation, was to search on the literature for validated instruments that have already been used in the past to measure the same or similar variables, see section 4.3.5.1. Independent items from the literature, used to measure different variables in different studies, were also added as they had potential semantical meaning to measure seven of the variables in study, as shown in Table 42. These measures were slightly adapted every time it was needed. Afterwards, a set of items were derived from interview extracts both to develop full measurement models for the variables that were not address by the previous literature review phase and to complete the measurement models of the variables that already contained items from the literature.

Items represent the theoretical understanding of the construct. Therefore, they should measure a specific aspect of it so that data gathered using those items can be subsequently related to the construct. This data will be essential for theory development as it will potentially indicate either if the theory is or is not supported (Beglar & Nemoto, 2014).

According to Hinkin (1995), content validity is perceived as "the minimum psychometric requirement for measurement adequacy". Content validity should be addressed since the beginning of items' development phase because a "measure must adequately capture the specific domain of interest yet contain no extraneous content". This author expresses two major concerns: the lack of content validity of the measures used in studies and the omission of the methodology followed to develop the measures.

In line with Beglar & Nemoto (2014), each item should only measure one idea, be written in a straightforward way and be easy to understand. That way, simple vocabulary and simple sentence construction should be used when developing items to ensure respondents comprehend them immediately. The use of conjunctions it is also not recommended.

Positive worded items are preferable over negative worded items. On the other side, positive and negative worded items shouldn't measure the same construct (Beglar & Nemoto, 2014). Even though

negatively worded items (reverse-scored items) have been employed to attenuate response pattern bias, this approach may reduce the validity of the questionnaire response and introduce systematic error (Hinkin, 1995). In the context of the analysis undertaken by Hinkin (1995), as explained before, 41% of the studies used reverse-scored items. There were no indications of problems during the analysis phase, however, reverse-scored items often had lower item loadings than positive worded items (Hinkin, 1995).

Adding to this, Urbach & Ahlemann (2010) expresses the concern that a block of indicators must completely reflective or completely formative and the analysis of results should correspond to the measurement model used.

Table 43 presents the items developed from interview extracts, organized by variable. The interviewee linked to the interview extract is also identified.

Table 43: Items developed from interview extracts

Variable	Items	Based on the interview extract
Manager	I feel there is someone managing Yammer	"someone who controls the content in it and also to control the Yammer" (INT-11)
	The groups I follow are being well managed	"it depends sometimes on the community manager. It actually depends on how the manager is managing the page," (INT-11)
	Yammer is being well managed	"Yammer global manager" (INT-3)
Policies	I feel there is policies regarding group creation I feel there is policies regarding content production	"I think with this global use of the tool, where people start to create different groups, the information start to disperse"
	I respect specific policies when I use Yammer	"everybody just started to using it without any policies." (INT-10)
	There are policies regulating Yammer use	"we didn't roll out any policies of what is this Yammer actually" (INT-10)
Objectives	I understand why to use Yammer	"there is always a new toy, then no one understand it is utility" (INT-5)
	There is a reason to use Yammer	"it is just more about why we are using it more?" (INT-8)
	I understand the objective of using Yammer	"I do not really know what is the objective of having this" (INT-11)
Usage information	I have the necessary information to use Yammer	"we got it but we got nothing about it, no tutorials, no information, it was just like a tool for us" (INT-12)
	I know what can be done in Yammer	"I don't even know all the opportunities that Yammer offers" (INT-12)
	I know how to use Yammer	"we need to know how we can use it" (INT-10)

Variable	Items	Based on the interview extract
Usage incentives	I was encouraged to use Yammer due to specific initiatives developed by the organization	"it was used as a platform for uploading our assignments etc" (INT-9) "at the beginning to push a bit we had a big incentive." (IN-2)
	The organization developed initiatives to encourage Yammer use	"we also asked to actively using it by putting a video, and also photos at the first place" (INT-11)
Utilization guidance	I received guidance about Yammer when I started to use it	"There was no training about how to use Yammer" (INT-3) "the information at the time just an email highlighting what it is and how to use it" (INT-7)
	I feel Yammer was well introduced to me	"I don't think that Denmark has ever introduced it well enough" (INT-10)
	I felt supported when I started to use Yammer	"we got it but we got nothing about it, no tutorials, no information, it was just like a tool for us, you can use it, but how to use you need to figure it out by yourself." (INT-12)
Content quality	The content of Yammer is relevant	"more relevance the information that goes (...), the more effective it is" (INT-7) "you know, obviously there is content that is more of interest" (INT-9)
	The content of Yammer is structured The content of Yammer looks organized	"organization of the content, in terms of how people using it, and also the structures of the content just seem very messy and not so professional." (INT-11)
	The content of Yammer is updated	"if it is updated regularly, like consistently once in the week, or once in the day, I think that is still ok"
Informal interaction	I think Yammer environment is informal	"I think it is going in the good direction for more information sharing and maybe also more informal"(INT-4)
	I interact in an informal way on Yammer	"not in a formal language" (INT-6)
Professional environment	I think Yammer environment is professional I interact in a professional way on Yammer	"it is professional" (INT-1) "it is really professional" (INT-6) "it is corporate" (INT-12)
Working feeling	I feel I'm not working when I use Yammer	"is this just a simple social platform, or that should be a platform that people use really for work?" (INT-11).
	I feel I'm doing a break when I use Yammer	"Actually I do feel that it is like a break of work when I go into Yammer." (INT-8)
Confidence	I don't feel constraint to post on Yammer	"Because if they don't want to show, or to tell" (INT-2)
	I feel confident to post on Yammer	"due to the fact I don't have to much knowledge about the company, I still feel a little bit shy" (INT-6)

Variable	Items	Based on the interview extract
Time	I don't have time to use Yammer	"mostly because I don't have time to look to Yammer" (INT-8)
	Using Yammer takes a lot of time	"you do need time to use Yammer" (INT-12)
Noise	It is difficult to keep up with all the information we receive	"today, I start to struggle a little bit to keep up with all the information that spreads through Yammer" (INT-3)
	I feel there are too many information sources I feel there is an overflow of information	"Why should I have four or five mail boxes at home? I just have one." (INT-5)
	I feel there are too many platforms I need to use to perform my activities	"because we still have many other platforms which employees are using daily" (INT-12)
	I feel there are too many communication platforms	"One more platform to communicate. I already have enough of them." (INT-5)
Platform accessibility	I don't have problems assessing Yammer through different networks	"without any access or without any VPN called" (INT-1)
	I don't have troubles assessing Yammer through different devices	"I use it on the application on my phone and I also use it on my tablet as well." (INT-7)
Value Expectancy	I will get some benefits by using Yammer	"they don't really see the benefits" (INT-4) "I guess this group will help us to solve many problems that are connected with collaboration between departments." (INT-12)
	I will get some return by using Yammer	"so until a point that i do not find it informative and helpful for me anymore" (INT-11).
	I see the advantage of using Yammer	"the second I see what this actually is, I will share it, I will make sure that we implemented it in our team, which is one of the leaders in Denmark, we have a very strong team, we are usually the first movers, but since we don't, we haven't bought the idea, we haven't bought the strategy, we don't know what it is, so obviously we don't use time on using if we don't know what it is at all." (INT-10)

4.3.5.3 Scale development

Likert-scales instruments have been employed during decades in questionnaires from the most variety of research fields as they are a simple way to measure opinions, attitudes and values. Likert measurement was developed by Rensis Likert, an American psychologist, and was published in 1932. Firstly perceived as a measurement scale for observable behaviours, soon it started to be used to measure unobservable phenomena, as "attitudes vary along a dimension from negative to positive" (Johns, 2010).

Every Likert item is formed by the statement and the response scale. Item statements should follow general item development good practices. The development of response scales should address specific concerns (Johns, 2010):

- Number of scale points: there are no restrictions regarding the length of the response scale because answers should reflect a continuum rather than a finite number of options. 5 Likert scales have become the most usual ones because they measure the direction and the strength of the opinion, as well they are also clear to respondents. Having complex Likert scales may induce respondents in error as the distinguish between two consecutive items may be not clear;
- Labelling response options: options labelling should be provided every time it is possible because it enables respondents to deliver higher quality data as the interpretation of a specific option may differ person to person. For big scales, the strategy to only label extreme options is usually adopted;
- Neutral midpoint: Likert scales usually include a neutral midpoint to avoid forcing respondents to adopt a positive or negative agreement when they don't have a clear opinion.

Data accuracy seem to drop for scales bellow five and above seven response options (Johns, 2010). Beglar & Nemoto (2014) suggest scales above six are not viable and scales of four response options suit well younger respondents or people with low motivation because they are easy to understand. Due to the high diversity of the potential inquiries in the company, a Likert-scale with five response options, ranging from 1- Strongly disagree to 5 – Strongly agree, Figure 21, was chosen to assess each of the items from the instrument.

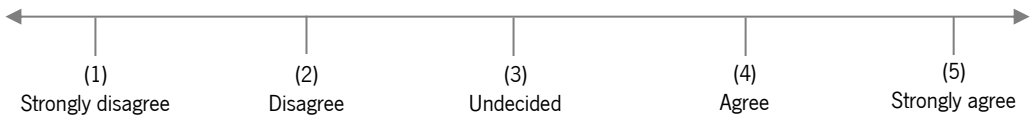


Figure 21: Developed Likert scale

The use of the same Likert scale across the questionnaire seems to be more popular among respondents (Johns, 2010). Therefore, the strategy is to apply this five-point Likert scale for the higher

number of items possible. For the variables Technology experience and Use, the measurement scales will be adapted from the original study - Brown et al. (2010).

In that study, a seven-point scale was used for the variable Technology experience, ranging from "None at all" to "Very extensive". This scale was reduced to a five-point scale and intermediate descriptions were added: 1- None at all, 2 - Little, 3 - Average, 4 - Extensive, 5 - Very extensive.

For the category Use, the Item "I rate my intensity of use of Yammer to be:" is measured using a seven-point scale, ranging from "Very light" to "Very heavy". The adopted scale is the following: 1-Very light, 2 - Light, 3 - Average ,4 - Heavy, 5 - Very heavy. The item "How frequently do you use Yammer:" is measured with a seven-point scale ranging from "Never" to "Very frequently". The scale was also adapted: 1-Never, 2 - Rarely ,3 - Sometimes, 4 – Frequently, 5 – Very frequently.

4.3.5.4 Instrument evaluation

The instrument evaluation strategy followed to validate the instrument in this survey research was based in the one proposed by D. W. Straub (1989) and focuses in ensuring the content validity, construct validity and the reliability of the instrument.

Content validity is related with representativeness of the measures of the instrument, that is to say that an instrument presents content validity if the measures capture the essence of the construct (D. Straub, Boudreau, & Gefen, 2004). A review process of the instrument with experts familiarized with the content of research seems to be useful to ensure content validity (D. W. Straub, 1989). Construct validity is an operational issue and ensures that items measuring a specific construct are stronger associated with that construct than with other constructs (D. Straub et al., 2004). Reliability is an evaluation of the accuracy of the measurement model, which means that respondents wouldn't have difficulties answering similar questions, in the same or in a similar way, each time (D. W. Straub, 1989).

Table 44 presents the evaluation steps performed in different phases of the survey and the respective validities assessed in each step.

Table 44: Instrument validation strategy

Survey phase	Evaluation steps performed	Content validity	Construct validity	Reliability
Instrument development (section 4.3.5)	Literature review	X	X	
	Item development based on interview extracts	X	X	
Pre-tests and improvements (Pre-test I – section 4.3.7.1)	Inter-rater reliability	X	X	X
	Discussion with participants	X	X	
Pre-tests and improvements (Pre-test II – section 4.3.7.2)	Inter-rater reliability	X	X	X
	Placement ratio	X	X	X
	Discussion with doctorates panel	X	X	
Full-scale survey (Findings – section 4.3.11)	Indicator reliability			X
	Cronbach alphas			X
	Composite reliability			X
	Average variance extracted (AVE)		X	
	Cross-loadings		X	
	Coefficient of determination (r^2)			X

4.3.6 Initial Instrument

Table 45 shows the initial instrument which resulted from the previous survey phase of instrument development, see section 4.3.5. Each item is identified by a code and measures a specific variable. Variable's measurement model is also presented.

Table 45: Initial instrument

Variable	Item code	Item
Manager	I-1	I feel there is someone managing Yammer
	I-2	Yammer is being well managed
	I-3	The groups I follow are being well managed
Policies	I-4	I feel there is policies regarding group creation
	I-5	I feel there is policies regarding content production
	I-6	I respect specific policies when I use Yammer
	I-7	There are policies regulating Yammer use
Utilization guidance	I-8	I received guidance about Yammer when I started to use it
	I-9	I feel Yammer was well introduced to me
	I-10	I felt supported when I started to use Yammer
	I-11	A specific person (or group) was/is available for assistance with difficulties with Yammer.
Usage incentives	I-12	I was encouraged to use Yammer due to specific initiatives developed by the organization
	I-13	The organization developed initiatives to encourage Yammer use
	I-14	There was the pressure from organization to use Yammer
Objectives	I-15	I understand why to use Yammer
	I-16	There is a reason to use Yammer
	I-17	I understand the objective of using Yammer
Usage information	I-18	I have the necessary information to use Yammer
	I-19	I know what can be done in Yammer
	I-20	I know how to use Yammer
Content quality	I-21	The content of Yammer is relevant
	I-22	The content Yammer is useful
	I-23	The content of Yammer is clear
	I-24	The content of Yammer is structured
	I-25	The content of Yammer looks organized
	I-26	Yammer looks organized
	I-27	The content of Yammer is updated
	I-28	The content of Yammer is current
Communication immediacy	I-29	Yammer enables me to quickly reach communication partners
	I-30	When I communicate with someone using Yammer, they usually respond quickly

Variable	Item code	Item
	I-31	When someone communicates with me using Yammer, I try to respond immediately
Enjoyment	I-32	While participating in Yammer I experienced pleasure.
	I-33	The process of participating in Yammer is enjoyable.
	I-34	I have fun using Yammer
Working feeling	I-35	I feel I'm not working when I use Yammer
	I-36	I feel I'm doing a break when I use Yammer
Informal interaction	I-37	I think Yammer environment is informal
	I-38	I interact in an informal way on Yammer
	I-39	I feel comfortable using informal communication (such as slang or abbreviations) with co-workers with whom I collaborate
Professional environment	I-40	I think Yammer environment is professional
	I-41	I interact in a professional way on Yammer
Critical Mass	I-42	Many people I communicate with use Yammer.
	I-43	The people I communicate with will continue to use Yammer in the future.
	I-44	The people I communicate with using Yammer will continue to use Yammer in the future.
	I-45	Of the people I communicate with regularly, many use Yammer
Platform accessibility	I-46	I don't have problems assessing Yammer through different networks
	I-47	I don't have troubles assessing Yammer through different devices
	I-48	Yammer is easy to access
	I-49	There isn't sufficient access to use Yammer
	I-50	I am not able to use Yammer when I need it
Effort expectancy	I-51	I think Yammer is easy to use
	I-52	Using Yammer is easy for me
	I-53	Using Yammer doesn't require a lot of mental effort
Management support	I-54	I believe the top management would like me to use Yammer
	I-55	My supervisor suggests that I use Yammer
Peers support	I-56	My friends think I should use Yammer
	I-57	My peers think I should use Yammer
	I-58	My co-worker think I should use Yammer
Noise	I-59	It is difficult to keep up with all the information we receive
	I-60	I feel there are too many information sources
	I-61	I feel there is an overflow of information
	I-62	I feel there are too many platforms I need to use to perform my activities
	I-63	I feel there are too many communication platforms
Time	I-64	I don't have time to use Yammer
	I-65	Using Yammer takes a lot of time
Language knowledge	I-66	I have the necessary language knowledge to use Yammer
Confidence	I-67	I don't feel constraint to post on Yammer
	I-68	I feel confident to post on Yammer

Variable	Item code	Item
	I-69	I feel apprehensive about using Yammer
	I-70	Yammer is somewhat intimidating me
Technological experience	I-71	My experience with social networks is: None at all . . . Very extensive
	I-72	My experience with social media is: None at all . . . Very extensive
	I-73	My experience with messaging tools (e.g., MSN messenger) is: None at all . . . Very extensive
	I-74	My experience with technologies similar to Yammer is: None at all . . . Very extensive
Value expectancy	I-75	I will get some benefits by using Yammer
	I-76	I will get some return by using Yammer
	I-77	I see the advantage of using Yammer
Use	I-78	I rate my intensity of use of Yammer to be: Very light . . . Very heavy
	I-79	How frequently do you use Yammer: Never . . . Very frequently
	I-80	On an average week, how much time (in hours) do you use Yammer?

4.3.7 Pre-tests and improvements

In line with Beglar & Nemoto (2014), questionnaire developers should contact people familiar with the constructs to refine their understanding. After, the list of items should be reviewed by independent reviewers to assess the relation of the items with the construct and the clarity used to phrase them. The revision process should proceed till a general agreement is achieved.

Thereby, two pre-tests were conducted to assess the validity of the initial instrument.

4.3.7.1 Pre-test I

a) Description

In conformity with Mchugh (2012), when a variable only has two possible and differentiated states, it is likely that reliability among data collectors will be high. However, when these states are less distinctive, the researcher needs to apply reliability tests to assess the agreement among data collectors. Rater reliability represents "the extent to which the data collected in the study are correct representations of the variables measured." and "is a component of overall confidence in a research study's accuracy".

In the scope of instrument development, testing rater reliability is a good assessment for content validity as it allows to measure the extent to which the items are perceived to be representative of a specific variable. In addition, low agreement scores can be denotative of variables or items misconception.

Therefore, in this first examination, two IT Interns in the company, who are IS students from University of Turku (Finland), were asked to map the items from the initial instrument to the corresponding variables. See Table 46 for more detailed information about their background. The students were provided with two papers: one with the variables names and definitions and other with the items organized in a random order. In the beginning, the researcher went through each variable and gave a brief explanation about its meaning. Participants were also asked to identify ambiguous items and write down comments that might seem useful. In the end, there was a brief discussion to collect perceptions and improvement suggestions.

Table 46: Participants in Pre-test I

Participant	Academic background	University	Working in the company?
Participant 1	Information Systems Science, Supply Chain Management and Business German	University of Turku	Yes
Participant 2	Information Systems Science, Marketing, Business Law and Business Spanish	University of Turku	Yes

Fleiss' Kappa is as indicator for inter-rater reliability and it was proposed by Fleiss (1971) as an extension of Cohen's Kappa to the measurement of agreement for a multiple and constant number of raters (Banerjee, Capozzoli, McSweeney, & Sinha, 1999). Cohen's kappa can range from -1 to +1. Zero represents the agreement expected from a random chance and 1 represents a perfect agreement between the raters. Values below zero are possible but unlikely (Mchugh, 2012). These values represent a poorer than chance agreement (Fleiss & Cohen, 1973).

Landis & Koch (1977) proposed a scale for agreement measures for categorical data, however these divisions are not supported by evidence, Table 47 :

Table 47: Interpretation of agreement measures

Kappa (K)	Meaning
$K \leq 0$	No agreement
$0,01 \leq K \leq 0,20$	Slight agreement
$0,21 \leq K \leq 0,40$	Fair agreement
$0,41 \leq K \leq 0,60$	Moderate agreement
$0,61 \leq K \leq 0,80$	Substantial agreement

$0{,}81 \leq K \leq 1{,}00$	Almost perfect agreement

To assess the inter-reliability of the test results, Fleiss' Kappa was computed using Real Statistics (Zaiontz, 2013), a freemium plugin for Microsoft Excel, developed by Charles Zaiontz (Zaiontz, n.d.).

b) Results

Table 48 presents the kappa values which resulted from the placement exercise. Kappa values and the respective p-values are shown per each single variable. The last row of the table contains the global kappa value of the exercise.

Table 48: Results from Pre-test I

Variable	Fleiss' kappa	
	Kappa	P-value
Manager	1,00	0,00
Policies	1,00	0,00
Utilization guidance	0,55	$7{,}99\times10^{-7}$
Usage incentives	0,65	$5{,}01\times10^{-9}$
Objectives	0,79	$1{,}27\times10^{-12}$
Usage information	0,79	$1{,}27\times10^{-12}$
Content quality	0,84	$4{,}55\times10^{-14}$
Communication immediacy	1,00	0,00
Enjoyment	0,85	$2{,}78\times10^{-14}$
Working feeling	1,00	0,00
Informal interaction	0,79	$1{,}27\times10^{-12}$
Professional environment	1,00	0,00
Critical Mass	0,79	$1{,}27\times10^{-12}$
Platform accessibility	1,00	0,00
Effort expectancy	1,00	0,00
Management support	1,00	0,00
Peers support	1,00	0,00
Noise	0,88	$2{,}89\times10^{-15}$
Time	0,79	$1{,}27\times10^{-12}$
Language knowledge	1,00	0,00
Confidence	0,65	$7{,}24\times10^{-9}$
Technological background	1,00	0,00
Value expectancy	0,74	$4{,}38\times10^{-11}$
Use	-0,03	0,82

Variable	Fleiss' kappa	
	Kappa	P-value
Ambiguous	-0,05	0,68
Total	0,80	0,00

The global kappa value of the exercise was 0,80 for a confidence level of 1% (p-value < 0,01), which is in the border line between a substantial and an almost perfect agreement as suggested by Landis & Koch (1977). Fourteen variables achieved almost perfect agreement scores ($0{,}81 \leq \text{kappa} \leq 1{,}00$), eleven of which with a score of 1,00, which means both participants placed the same items in each one of those eleven variables. Eight variables obtained substantial agreement scores ($0{,}61 \leq \text{kappa} \leq 0{,}80$) and one variable, Utilization guidance, obtained just a moderate agreement score ($0{,}41 \leq \text{kappa} \leq 0{,}60$). The kappa value of the variable Use is lower than zero which indicates no agreement. All the kappa values are statistically significant for a confidence level of 1% (p-values < 0,01), except the kappa value of the variable Use, that is not statistically significant.

c) Instrument improvements

By bringing together the results from the placement exercise and the feedback provided by the participants, the instrument was improved by deleting or rephrasing items. These improvements focused on the items which were wrongly placed or whose variables obtained lower kappa values. The objective behind these improvements is to ensure that the items are phrased in a clear way and are intrinsically related with the respective variable/construct.

Items I-10 and I-11, both belonging to the variable Utilization Guidance, were incorrectly assigned. I-10 was assigned to the variable Management Support and I-11 was rated as ambiguous. Because both items relate to the assistance or support to users, they were merged into one:

I-10: I feel someone was available to assist me when I started to use Yammer

Item I-16, "There is a reason to use Yammer", was assigned by both participants to the category Value Expectancy, however, the correct category was Objectives. Asking about the objectives in using Yammer is a straight forward question, thereby, the other two items seem to be enough to measure this variable. Item I-16 was deleted.

Item I-26, “Yammer looks organized”, was deleted as the Item I-24 and the Item I-25 already cover the idea of structured or organized content. The item was not intrinsically related with Yammer’s content but with Yammer as a platform.

Item I-39, “I feel comfortable using informal communication (such as slang or abbreviations) with co-workers with whom I collaborate”, was rephrased. In first place, the adjective comfortable was eliminated as it induced one of the participants to place the item on the variable Confidence. On the participant’s eyes, someone who is comfortable using informal communication is someone who is confident. On the other hand, the segment “(such as slang or abbreviations)” was also eliminated as it could induce people to associated informal communication with an incorrect way of writing. The segment “on Yammer” was added to clarify that the informal way of communication happens on Yammer.

I-39: I use informal communication with co-workers with whom I collaborate on Yammer

Item I-43, “The people I communicate with will continue to use Yammer in the future”, and I-44, “The people I communicate with using Yammer will continue to use Yammer in the future”, were considered ambiguous or placed on the variable Use (the case of I-44). The participants though that the use of the future verbal tense is confusing. The items are based on the premise participants know their co-works intention to continue using Yammer in the future, what can mislead the measurement. The items were deleted.

Item I-60, “I feel there are too many information sources”, has caused some doubts in one of the participants because it wasn’t clear if the information sources were referring to Yammer or to the organization, in general. Therefore, the item was rephrased:

I-60: I feel there are too many information sources inside the organization

Item I-67, “I don’t feel constraint to post on Yammer”, caused some doubts as the meaning of constraint was not clear. That way, the word “constraint” was replaced by “discomfort”:

I-67: I don’t feel discomfort to post on Yammer

Item I-77, “I see the advantage of using Yammer”, was assign by one of the participants to the variable Objectives. By analysing the results, participants seem to have felt some overlapping between those variables. I-16 (measure for Objectives) had also been assign to the variable Value Expectancy. That way, I-77 was rephrased to better express the meaning of the variable:

I-77: I expect some utility when I use Yammer

Even though the kappa value of the variable Use was lower than a random chance, the decision was not to replace or rephrase the items as they were widely tested before and one of the participants placed all the items on the right place. The other participant, included I-55 and I-59 in category Ambiguous and assigned I-71 to the Variable Time because it refers to the time spent using Yammer. This participant understood that asking about aspects as the frequency or intensity made the items more ambiguous.

After the conduction and analysis of the result from pre-test I, it was possible to understand that the placement exercise was beneficial to identify issues in the instrument and correct them. Thereby, the conduction of a second placement exercise, with more participants, and a discussion of results with a panel of experts would be even more advantageous to obtain an instrument capable of clearly measure the variables in study.

4.3.7.2 Pre-test II

a) Description

In an initial phase, six individuals with different academic degrees and backgrounds, obtained in different universities across Europe, were asked to participate in another placement exercise. The test also consisted in matching items with variables, but this time the test was done remotely using an Excel file. The document was organized with the items ordered randomly in the lines and the variables on the columns. Each user should match each item with a single variable or with an ambiguous category, filling a specific cell with an "X". Participants were asked to add comments to justify their choices in case of need. Kappa values and placement ratios were calculated from the results to identify problematic variables and items.

Placement ratio was calculated using the following formula (Moore & Benbasat, 1991):

$$\text{Placement ratio} = \frac{\text{Number of correct placements}}{\text{Total number of placements}}$$

Placement ratio varies between 0 and 1. This measure is important to assess if the participants agree with the initially defined correct placement of items into variables (Moore & Benbasat, 1991). It can happen the kappa value (agreement) is high and the placement ratio very low, and vice versa.

Table 49 presents a brief description of the academic background of the participants. Two of the participants were working in the company by the time the exercise was conducted. Each individual was not identified as it didn't provide value for this research.

Table 49: Participants in the placement ratio of Pre-test II

Participant	Academic background	University	Working in the company?
Participant 3	Engineering and Management of Information Systems	University of Minho, Portugal	No
Participant 4	Business Administration and Information Systems Science	University of Turku, Finland	Yes
Participant 5	Business	University of Augsburg, Germany	Yes
Participant 6	Applied Languages	University of Minho, Portugal	No
Participant 7	Engineering and Management of Information Systems	University of Minho, Portugal	No
Participant 8	Doctorate with research on implementation of BPM systems	University of Utrecht, Netherlands	No

In a second phase of the test, the instrument was reviewed by a distinct panel of doctorates. The three participants also have distinct academic backgrounds and experience in instrument development, in the context of their academic research activities. Two of the participants persuaded an academic career and, therefore, have a path of teaching and research. The other doctorate is currently working in the company. Their feedback was important to ensure the quality of the instrument. While the calculation of kappa values and placement ratios is important to identify problems in the instrument, their feedback is important to fix these same issues and generally improve the instrument.

Table 50 shows the academic background of the doctorates.

Table 50: Constitution of the panel of doctorates of Pre-test II

Participant	Academic background	University	Working in the company?
Participant 9	PhD in Management Information Systems Professor at Department of Information Systems	University of Georgia, USA University of Minho, Portugal	No
Participant 10	PhD in Information Systems Professor at Department of Information Systems	University of Manchester, UK University of Minho, Portugal	No
Participant 11	PhD in Philosophy	University of Munich	Yes

These validation steps are important to ensure the content and construct validity and the reliability of the instrument.

b) Results

Table 51 shows the results from the placement exercise of Pre-test II, more specifically, the placement ratios and kappa values.

Table 51: Results from the placement exercise of Pre-test II

Variable	Item	Placement ratio	Fleiss kappa	
			Kappa	P-value
Manager	I-01	0,83	0,81	0,00
	I-02	1,00		
	I-03	1,00		
Policies	I-04	1,00	0,90	0,00
	I-05	0,83		
	I-06	0,83		
	I-07	1,00		
Utilization guidance	I-08	1,00	0,75	0,00
	I-09	0,83		
	I-10	1,00		
Usage incentives	I-12	1,00	0,53	0,00
	I-13	0,67		
	I-14	0,33		
Objectives	I-15	1,00	0,83	0,00
	I-17	0,83		
Usage information	I-18	0,00	0,64	0,00
	I-19	0,50		
	I-20	0,83		
Content quality	I-21	1,00	0,76	0,00
	I-22	0,83		
	I-23	0,67		
	I-24	0,67		
	I-25	0,67		
	I-27	1,00		
	I-28	0,83		
Communication immediacy	I-29	0,83	0,87	0,00
	I-30	1,00		
	I-31	0,83		
Enjoyment	I-32	1,00	0,75	0,00

Variable	Item	Placement ratio	Fleiss kappa	
			Kappa	P-value
	I-33	1,00		
	I-34	1,00		
Working feeling	I-35	1,00	0,76	0,00
	I-36	0,67		
Informal interaction	I-37	0,67	0,68	0,00
	I-38	0,83		
	I-39	0,83		
Professional environment	I-40	1,00	0,76	0,00
	I-41	0,83		
Critical Mass	I-42	0,50	0,39	0,00
	I-45	0,67		
Platform accessibility	I-46	1,00	0,81	0,00
	I-47	1,00		
	I-48	0,83		
	I-49	0,83		
	I-50	0,33		
Effort expectancy	I-51	0,67	0,53	0,00
	I-52	0,67		
	I-53	0,83		
Management support	I-54	0,67	0,52	0,00
	I-55	0,67		
Peers support	I-56	0,83	0,66	0,00
	I-57	1,00		
	I-58	0,83		
Noise	I-59	1,00	0,92	0,00
	I-60	1,00		
	I-61	0,83		
	I-62	0,83		
	I-63	1,00		
Time	I-64	1,00	0,88	0,00
	I-65	1,00		
Language knowledge	I-66	1,00	1,00	0,00
Confidence	I-67	0,67	0,50	0,00
	I-68	1,00		
	I-69	0,33		
	I-70	0,33		
Technological experience	I-71	0,67	0,69	0,00
	I-72	0,67		
	I-73	0,83		
	I-74	1,00		
Value expectancy	I-75	1,00	0,75	0,00

Variable	Item	Placement ratio	Fleiss kappa	
			Kappa	P-value
	I-76	0,83		
	I-77	0,83		
Use	I-78	1,00	0,61	0,00
	I-79	1,00		
	I-80	0,67		
Ambiguous	-	-	-0,02	0,52
Total	-	-	0,70	0,00

The total kappa value of the placement exercise is 0,70, which indicates a substantial agreement according to Landis & Koch (1977). Eight variables achieved almost perfect agreement scores ($0{,}81 \leq \text{kappa} \leq 1$). Eleven variables achieved substantial agreement scores ($0{,}61 \leq \text{kappa} \leq 0{,}80$). Four variables achieved moderate agreement scores ($0{,}41 \leq \text{kappa} \leq 0{,}60$) and one variable, Critical mass, obtained just a fair agreement score ($0{,}21 \leq \text{kappa} \leq 0{,}40$). All kappa values are statistically significant for a confidence level of 1% (p-values $\leq 0{,}01$).

c) Instrument improvements

After the analysis of the results and of the discussion with the panel of doctorates, the instrument was improved once again. As previously explained, the goal was to obtain a valid instrument to measure the variables in study. Thereby, six variables suffered changes in their names and/or definitions and a set of items was deleted, rephrased or replaced. These improvements focused mainly on the variables with lower kappa values and on the items with lower placement ratios.

c.1) Managers

Even though the results for this variable are satisfactory, the variable was renamed as "Content management" to be more specific, and defined as the "Extent to which users perceive that Yammer content is being well managed", as result of the the discussion with doctorates. This construct was already associated with the existence of someone who manages the platform content, therefore the focus was changed from the entity managing the content - managers - to the activity they were performing - content management. Item I-1 was deleted because it was too abstract and I-2 and I-3 were rephrased in order to address the changes in the construct.

I-02: Yammer content is being well managed I-03: The content of the Yammer groups I follow is being well managed

c.2) Policies

I-04 and I-05 were rephrased because the verb "to feel" has an abstract connotation and the existence of policies is something precise.

I-04: There are policies regarding group creation I-05: There are policies regarding content production

c.3) Utilization Guidance

The definition of the variable was rephrased to "Extent to which users perceive they were guided when they started to use Yammer". Items I-09 was replaced and I-10 was rephrased to better express the meaning of the construct. The justification regarding the verb "to feel" also applies for this set of items.

I-09: I received information about Yammer when I started to use it I-10: Someone guided me when I started to use Yammer

c.4) Usage Incentives

This variable had an agreement of 0,53 because there were some users matching items from the variable "Management support" within this category and, in the other side, some of the items belonging to the variable "Usage Incentives" were associated with the variable "Utilization guidance". Therefore, to avoid the overlapping with other variables, the strategy was to change the variable name to "Encouragement initiatives" and to make the variable definition more specific - "extent to which users perceive the organization developed initiatives on Yammer to encourage Yammer use". Item I-13 suffered a small improvement and the I-14 was replaced because it was too ambiguous.

I-13: The organization developed initiatives on Yammer to encourage Yammer use I-14: The organization developed initiatives to encourage user participation (create posts, upload documents, images or videos, like and comment) on Yammer

c.5) Usage Information

This variable had a moderate agreement because participants almost didn't agree on the placement of item I-19 which lead to its replacement. After the discussion with the doctorates, the variable name and definition was changed to "Utilization knowledge" and "Extent to which users know how to use Yammer", respectively. Item I-18 was deleted as none of the participants placed the item in the correct category.

I-19: I understand how to use Yammer

c.6) Content Quality

From the seven initial items, only I-21, I-24 and I-27 were selected not only to reduce the size of the survey, but also because they cover the most significant aspects related to content quality retrieved from the interviews to end-users. I-27 was slightly rephrased.

I-27: The content of Yammer is up to date

c.7) Communication immediacy

Due to the feedback provided by the doctorate panel, all the items were rephrased because they were too focused on "communication" and Yammer is an interactive platform that can be used for a lot of different things besides communication. The inclusion of words as "reach", "interaction" or "posts" are better suited for this kind of survey.

I-29: Yammer enables me to quickly reach work partners
I-30: When I post on Yammer, usually I get feedback quickly
I-31: When someone posts on Yammer, usually I give feedback quickly

c.8) Enjoyment

I-32 was deleted because the word "pleasure" seems to be too strong to describe the feeling of using a platform as Yammer.

c.9) Informal interaction

The name and definition of the construct were changed to "Informal language" and "extent to which users communicate using an informal language" in the platform. The reason behind this change resides on the fact variables informal environment and professional environment are perceived as opposites. An ESN informal environment is mainly visible using informal language, thereby, this alteration increases construct validity.

I-37: People use informal language to interact on Yammer
I-38: I use an informal language to interact on Yammer
I-39: I use informal language with people I collaborate with, on Yammer

c.10) Professional environment

I-41 was replaced and I-81 was added in order to add more dimensions to measurement of the variable by recommendation of the doctoral panel.

I-41: People keep a professional conduct on Yammer
I-81: People have a professional behaviour on Yammer

c.11) Critical Mass

From the results, a rater reliability of 0,39 was an evidence of an overlapping with the category peers support. The definition of the variable was improved to "Extent to which users perceive enough users have adopted Yammer" as the one used before was too complex and not completely clear to the participants. From the discussion with the doctorates, I-42 and I-45 items were rephrased because they emphasized on communication partners which was too restrictive.

I-42: Many people I work with, use Yammer.
I-45: Of the people, I regularly interact with, many use Yammer

c.12) Platform accessibility

I-48 and I-49 were deleted to shorten the survey. I-50 was rephrased because the impossibility to use Yammer was not specified previously.

I-50: I am not able to use Yammer when I need due to access problems

c.13) Effort expectancy

The agreement in this variable was moderate, however, no main changes were performed. In one side, the set of items used is widely accepted and validated and, on the other side, some users were misled by weak variable definitions that made the placement ambiguous among some other variables. Item I-53 was rephrased to a positive worded item.

I-53: Using Yammer doesn't require a lot of mental effort

c.14) Management support

I-55 was slightly rephrased. There was some overlapping between this variable and Usage incentives, Peers support and Managers. Changes on names and definitions of these variables seemed to be sufficient to improve the agreement in this variable.

I-55: My supervisor expects that I use Yammer

c.15) Confidence

The low agreement of the variable Confidence is due to an ambiguous variable definition. Confidence was defined as "Users confidence on using Yammer" which mislead users to match items related with Effort Expectancy, Usage Information or Objectives variables with this variable. Therefore, the definition was changed to "Extent to which users are confident expressing their feelings, doubts and opinions on Yammer". Items were also changed to better express its meaning. I-70 was deleted.

I-67: I feel confident asking questions on Yammer
I-68: I feel confident expressing my opinion on Yammer
I-69: Overall, I feel confident using Yammer

c.16) Technology experience

I-72 and I-73 were rephrased as "social collaboration tools seemed" to be more specific than "social media" and "WhatsApp" a more updated example of a messaging tool.

I-72: My experience with social collaboration tools is: None at all . . . Very extensive
I-73: My experience with messaging tools (e.g., WhatsApp) is: None at all . . . Very extensive

c.17) Value expectancy

I-77 was rephrased to be clearer.

I-77: I think Yammer is useful for my job

Pre-test II was useful to identify issues on the instrument and to correct them. The feedback from the panel of doctorates allowed to clearly distinguish the variables, by changing their names and definitions, in order to avoid overlaps among them. On the other side, the final set items is believed to be representative of the constructs they are measuring.

A general agreement about the instrument validity was obtained and, therefore, the decision to not conduct a third test was taken. In the following sections 4.3.8 and 4.3.9, the improved instrument and the final SEM model to be tested are presented.

4.3.8 Final Instrument

Table 52 shows the final set of variables and its definitions, that resulted from the validation steps described in the previous section 4.3.7.

Table 52: Final list of latent variables and definitions

Latent variable	Variable definition
Content Management	Extent to which users perceive that Yammer content is being well managed
Policies	Extent to which users perceive the existence of Yammer policies
Utilization guidance	Extent to which users perceive they were guided when they started to use Yammer
Encouragement initiatives	Extent to which users perceive the organization developed initiatives on Yammer to encourage Yammer use
Objectives	Extent to which users understand Yammer objectives
Utilization knowledge	Extent to which users know how to use Yammer
Content quality	Extent to which users perceive that Yammer content has quality
Communication Immediacy	"extent to which a collaboration technology enables the user to quickly communicate with others" (Brown et al., 2010b)
Enjoyment	Extent to which users perceive that Yammer environment is enjoyable
Working feeling	Extent to which users perceive that Yammer is a platform used to work
Informal language	Extent to which users communicate using an informal language

Latent variable	Variable definition
Professional environment	Extent to which users perceive that Yammer environment is professional
Critical mass	Extent to which users perceive enough users have adopted Yammer
Platform accessibility	Degree of ease associated with the access to Yammer
Effort expectancy	"degree of ease associated with the use of the system" (Venkatesh et al., 2003)
Management support	Extent to which users perceive that management supports Yammer usage
Peers support	Extent to which users perceive that their peers support Yammer usage
Noise	Existence of a "significant set of software applications available to perform their activities, a multitude of communication channels" and "an increased information overflow". (Bullinger et al., 2011)
Time	Extent to which users perceive they don't have time to use Yammer
Confidence	extent to which users are confident expressing their feelings, doubts and opinions using Yammer
Technology experienced	Users technological experience
Value expectancy	Extent to which users perceive Yammer as being a useful tool from which they can benefit if they use it
Use	Intensity, frequency and duration to which users use Yammer

After the development work described in section 4.3.5 and the evaluation steps described in section 4.3.7, Table 53 presents the final instrument used to develop the questionnaire, which was made available for the employees of the company. The table also contains information regarding the measurement model of each variable. All the variables have reflective measurement models except the variable Content Quality, which has a formative measurement model.

While in reflective measurement models the items are interchangeable as they measure the same aspect of the construct, in formative measurement models, each item measures a different aspect of the construct (W. W. Chin, 1998; Urbach & Ahlemann, 2010). Content quality is related with three different aspects: relevance, structure and up-to-dateness, thereby the items measure three different aspects of the construct – formative measurement model. For the remaining variables, the items are interchangeable – reflective measurement models.

Table 53: Final instrument

Variable	Item code	Item	Measurement model
Content Management	I-02	Yammer content is being well managed	Reflective
	I-03	The content of the Yammer groups I follow is being well managed	
Policies	I-04	There are policies regarding group creation	Reflective
	I-05	There are policies regarding content production on Yammer	
	I-06	I respect specific policies when I use Yammer	
	I-07	There are policies regulating Yammer use	
Utilization guidance	I-08	I received guidance about Yammer when I started to use it	Reflective
	I-09	I received information about Yammer when I started to use it	
	I-10	Someone guided me when I started to use Yammer	
Encouragement initiatives	I-13	The organization developed initiatives on Yammer to encourage Yammer use	Reflective
	I-14	The organization developed initiatives to encourage user participation (create posts, upload documents, images or videos, like and comment) on Yammer	
Objectives	I-15	I understand why to use Yammer	Reflective
	I-17	I understand the objective of using Yammer	
Utilization knowledge	I-19	I understand how to use Yammer	Reflective
	I-20	I know how to use Yammer	
Content quality	I-21	The content of Yammer is relevant	Formative
	I-24	The content of Yammer is structured	
	I-27	The content of Yammer is up to date	
Communication Immediacy	I-29	Yammer enables me to quickly reach work partners	Reflective
	I-30	When I post on Yammer, usually I get feedback quickly	
	I-31	When someone posts on Yammer, usually I give feedback quickly	
Enjoyment	I-33	The process of participating in Yammer is enjoyable.	Reflective
	I-34	I have fun using Yammer	
Working feeling	I-35	I feel I'm not working when I use Yammer	Reflective
	I-36	I feel I'm doing a break when I use Yammer	
Informal language	I-37	People use informal language to interact on Yammer	Reflective
	I-38	I use an informal language to interact on Yammer	
	I-39	I use informal language with people I collaborate with, on Yammer	
Professional environment	I-40	I think Yammer environment is professional	Reflective
	I-41	People keep a professional conduct on Yammer	
	I-81	People have a professional behaviour on Yammer	
Critical mass	I-42	Many people I work with, use Yammer.	Reflective
	I-45	Of the people I regularly interact with, many use Yammer	
Platform accessibility	I-46	I don't have problems accessing Yammer through different networks	Reflective
	I-47	I don't have problems accessing Yammer through different devices	
	I-50	I am not able to use Yammer when I need due to access problems	

Variable	Item code	Item	Measurement model
Effort expectancy	I-51	I think Yammer is easy to use	Reflective
	I-52	Using Yammer is easy for me	
	I-53	Using Yammer requires a lot of mental effort	
Management support	I-54	I believe the top management would like me to use Yammer	Reflective
	I-55	My supervisor expects that I use Yammer	
Peers support	I-56	My friends think I should use Yammer	Reflective
	I-57	My peers think I should use Yammer	
	I-58	My co-workers think I should use Yammer	
Noise	I-59	It is difficult to keep up with all the information I receive	Reflective
	I-60	I feel there are too many information sources inside the organization	
	I-61	I feel there is an overflow of information in the organization	
	I-62	There are too many platforms I need to use to perform my activities	
	I-63	There are too many communication platforms in the organization	
Time	I-64	I don't have time to use Yammer	Reflective
	I-65	Using Yammer takes a lot of time	
Confidence	I-67	I feel confident asking questions in Yammer	Reflective
	I-69	I feel confident expressing my opinion in Yammer	
	I-70	Overall, I feel confident to interact in Yammer	
Technological experience	I-71	My experience with social networks is	Reflective
	I-72	My experience with social collaboration tools is	
	I-73	My experience with messaging tools (e.g., WhatsApp) is	
	I-74	My experience with technologies similar to Yammer is: None at all . . . Very extensive	
Value expectancy	I-75	I will get some benefits by using Yammer	Reflective
	I-76	I will get some return by using Yammer	
	I-77	I think Yammer is useful for my job	
Use	I-78	I rate my intensity of use of Yammer to be: Very light . . . Very heavy	Reflective
	I-79	How frequently do you use Yammer: Never . . . Very frequently	
	I-80	On an average week, how much time (in hours) do you use Yammer?	

4.3.9 SEM Model

Figure 22 represents the SEM model to be tested using the questionnaire responses. The model presents both the structural and measurement models.

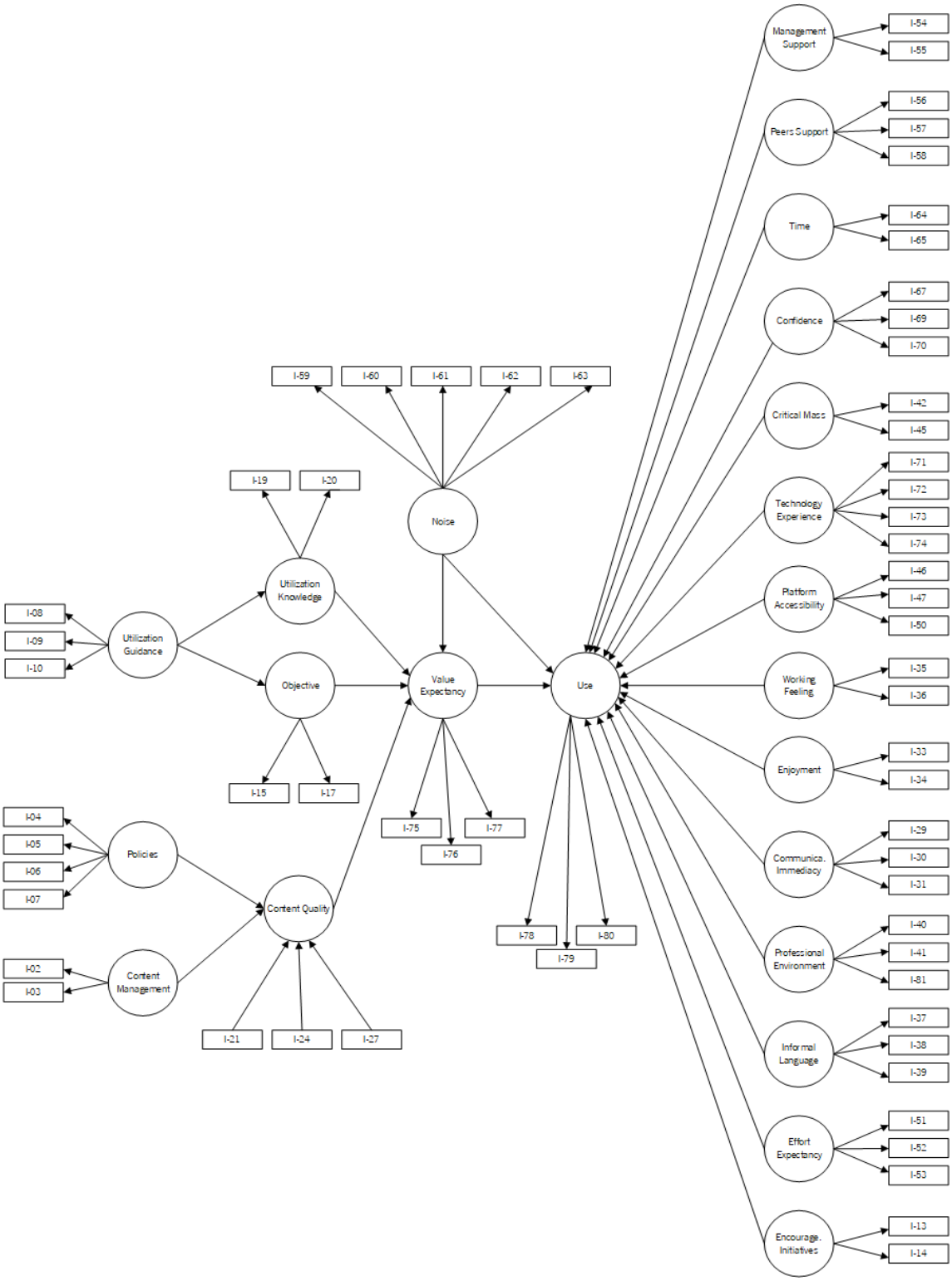


Figure 22: SEM model

4.3.10 Full Scale Survey

a) Questionnaire administration process

The questionnaire was developed in a SharePoint site using the survey app provided by the platform for that purpose. The survey was conducted from 7th to 31th of July and it was shared in several Yammer groups. Because the survey was conducted during summer vacation time, emails were also sent to around 5000 employees with the hope to increase the number of answers. Every time the survey was shared, people were asked to answer and share it with their colleagues. Company identity management system ensured that people could only answer the questionnaire once, what makes it impossible to have duplicated answers.

Items were presented in a random order, but inside general categories with the intention to keep a basic structure in the questionnaire and to assure its user-friendliness. Variables in study and their definitions were not provided. The questionnaire contained some demographic questions and a text box where respondents could leave some comments.

The questionnaire is available in Appendix A - Questionnaire.

b) Description of the sample and sampling technique

The idea in conducting this survey was to enable everyone in the company to participate if they were interested in doing so. Because the company universe is too complex - different groups of workers, locations and technological realities - and the information needed to categorize employees that is currently available was not completely reliable, it was impossible to create a representative sample of employees. On the other side, the survey was not mandatory, and thereby, the response rate would be much lower if only a reduced set of employees was asked to answer the survey.

Nevertheless, the final set of participants is diverse. Age ranges are wide and there are representatives of both sex - 33% of the respondents are female and 67% are male. There are respondents representing all work groups - IT department categorizes employees in seven work groups depending on their technological needs to perform their work - and all regions. In total, people from 45 countries have answered the questionnaire. Table 54 shows respondents characteristics in detail.

Table 54: Survey participants characteristics

Characteristics	Description	Frequency	Relative frequency	Total
Sex	Female	67	33%	201
	Male	134	67%	(100%)
Age	[20;30[	58	29%	201
	[30;40[	72	36%	(100%)

	[40;50[	52	26%	
	[50;60[	18	9%	
	[60;70[	1	0%	
Work group	Engineers (Business units and IT)	20	10%	201 (100%)
	Field Engineers	9	4%	
	Managers and Assistants	49	24%	
	Sales agents and Sales managers	48	24%	
	Customer Service and Stores	12	6%	
	Supporting functions	56	28%	
	Technicians in plants, logistics and tool service	7	3%	
Region	Asia	21	10%	201 (100%)
	Northern Europe	16	8%	
	Western Europe	39	19%	
	Central Europe	36	18%	
	South Europe/Balkans	26	13%	
	Eastern Europe	11	5%	
	Middle East and Africa	7	3%	
	Northern Europe	33	16%	
	Latin America	12	6%	

c) Response rates

The survey was answered by 201 employees. Considering that the company has around 23 000 employees, the response rate was 0,9%.

4.3.11 Findings

4.3.11.1 Introductory notes

Before going through findings, in this section, it is presented the process conducted to clean data and the analysis of the sample requirements in order to understand if the number of questionnaire responses is sufficient to test the SEM model in study. Adding to this, the technology and the algorithms/techniques used are also described. In the end of the section, it is possible to observe the process which was followed to assess the outputs of these algorithms/techniques.

a) Data cleaning procedures

According to Hair, Hult, Ringle, & Sarstedt (2017), empirical data, collected using questionnaires, needs to be examined in order to identify issues related with missing data, suspicious response patterns, outliers and data distributions.

Questionnaire responses have no issues of missing data because the questionnaire had to be completely filled in order to be submitted. That means that if a user tried to submit the questionnaire before answering all questions, a warning message would be shown, blocking the submission. Adding to this, response biases patterns were not identified. It is true that some respondents have rated the items from same category of items in the same way, however, the patterns identified are not inconsistent with logical and possible responses. Following this line of though, outliers' assessment was not conducted as individuals had a scale for rating each of the items and, therefore, each of the five possible answers (5-point Likert-scale) are acceptable. To refute an outlier answer is complicated because it is impossible to know respondents' reasons behind such answers.

PLS-SEM doesn't require data to be normally distributed, however extremely non-normal data can be problematic when assessing the significance of model's parameters. Hair et al. (2014) recommends the evaluation of skewness and kurtosis measures to identify these issues. Skewness assesses if data is symmetrical and kurtosis assesses if data is too peaked. A normal distribution is characterized by skewness and kurtosis values close to zero. A skewed data distribution happens when the distribution is stretched to the left or the right (skewness values greater than +1 or lower than -1). A data distribution is too peaked when kurtosis values are greater than +1. In opposition, kurtosis values lower than -1 indicate too flat distributions.

Skewness and Kurtosis values were calculated using the functions SKEWTEST and KURTTEST in Microsoft Excel, Table 55.

Table 55: Skewness and kurtosis analysis' results

Item	Average	Skewness	Kurtosis
I-02	3,274	-0,382	-0,234
I-03	3,527	-0,677	0,803
I-04	3,070	-0,252	0,260
I-05	3,194	-0,134	0,094
I-06	3,662	-0,303	0,056
I-07	3,119	-0,168	0,331
I-08	2,443	0,478	-0,925
I-09	2,826	-0,079	-1,216
I-10	2,264	0,665	-0,737
I-13	3,095	-0,221	-0,962
I-14	3,269	-0,443	-0,744
I-15	3,876	-1,065	0,560
I-17	3,851	-1,020	0,471
I-19	4,194	-1,513	3,019
I-20	4,214	-1,445	3,037
I-21	3,468	-0,547	-0,173
I-24	3,070	-0,027	-0,491
I-27	3,587	-0,442	0,248
I-29	2,816	0,050	-0,988
I-30	3,080	-0,160	-0,588
I-31	2,816	0,021	-1,075
I-33	3,577	-0,727	0,119
I-34	3,403	-0,500	-0,616
I-35	2,502	0,489	-0,899
I-36	2,836	0,190	-0,981
I-37	3,388	-0,440	-0,341
I-38	3,214	-0,344	-0,854
I-39	3,289	-0,448	-0,599
I-40	3,896	-1,186	1,764
I-41	3,980	-1,170	1,720
I-42	2,871	0,027	-1,012
I-45	2,811	-0,028	-1,090
I-46	3,886	-0,442	-0,516
I-47	3,910	-0,802	0,235
I-50	4,184	-1,267	0,982
I-51	4,124	-1,353	1,871
I-52	4,090	-1,209	1,165
I-53	4,040	-1,051	0,339
I-54	3,746	-0,797	0,349
I-55	3,159	-0,228	-0,991
I-56	2,393	0,233	-0,702

Item	Average	Skewness	Kurtosis
I-57	2,811	-0,043	-0,741
I-58	3,085	-0,208	-0,706
I-59	3,363	-0,248	-0,944
I-60	3,592	-0,440	-0,786
I-61	3,199	-0,079	-0,966
I-62	3,279	-0,012	-1,076
I-63	3,512	-0,502	-0,666
I-64	2,990	0,121	-1,024
I-65	2,622	0,500	-0,529
I-67	3,214	-0,246	-0,758
I-69	3,423	-0,607	-0,370
I-70	3,642	-0,835	0,287
I-71	3,706	-0,359	-0,437
I-72	3,478	-0,210	-0,444
I-73	4,050	-1,059	0,859
I-74	3,597	-0,430	-0,236
I-75	3,592	-0,693	-0,263
I-76	3,468	-0,599	-0,171
I-77	3,537	-0,590	-0,410
I-78	2,726	-0,266	-0,911
I-79	3,383	-0,499	-1,004
I-80	2,836	6,942	56,215
I-81	3,831	-0,803	0,709

Items I-15, I-17, , I-19, I-20, I-40, I-41, I-50, I-51, I-52, I-53, I-73 present skewness and/or kurtosis as characteristic of non-normal data distributions, however, the values are just slightly away from the preferable intervals. In the opposite side, I-80 also shows skewness and kurtosis, but in this case, the values deviate more from the recommended intervals. I-80 presents a skewness value of 6,942 and a kurtosis value of 56,215. Both values are much greater than 1, which indicates an extreme non-normal distribution. Therefore, the decision to eliminate this item from the future analysis was made.

None of the questionnaire responses was eliminated.

b) Sample requirements

Regarding sample requirements, W. W. Chin (2010) suggests a sample size of 20 cases per endogenous variable of the SEM model, thereby, for this study, 100 cases would be enough as the model comprises five endogenous variables. However, a higher number of cases is important to improve accuracy. Hair et al. (2017) recommend that a minimum sample size should be 10 times the maximum number of arrows point to a single latent variable in the model. In this research model, there are 15 arrows pointing to the variable Use, which makes 150 cases. The model was calculated using 201 cases, a number that fulfils both requirements above.

c) Algorithms and Techniques

In order to assess the model in study, three algorithms/techniques were executed: PLS algorithm, bootstrapping and blindfolding.

PLS algorithm is an analysis technique that explores the linear relationships between independent and dependent variables, being used to estimate the model. Path models are made of two elements: (Urbach & Ahlemann, 2010):

- The structural model (inner model) which describes the relationships between the latent variables;
- The measurement models (outer models) which describes the relationships between the latent variables and their measures.

According to Hair et al. (2014) , on the basis of the estimated path coefficients, it is possible to assess if the theoretical hypothesis can be accepted empirically and to argue about the size effect of the exogenous latent variables in predicting the endogenous variables. However, for that kind of analysis, the significance of such relationships needs to be assessed.

The bootstrapping is a resampling technique that creates subsamples of the original data and estimates the model in each subsample. That way, it is possible to determine errors of coefficients and assess the statistical significance of the relationships. Significance testing is the process of testing if a certain result has occurred by chance. In this context, it involves testing whether a path coefficient is truly different from zero in the population. Assuming a specified significance level, we reject the null hypothesis of no effect (i.e., the path coefficient is not different from zero in the population).

To make such analysis, researchers can compare coefficient's t-value with reference t-values or compare coefficient's p-value with different significance levels. If the empirical t value of a coefficient is larger than the reference t value for a X significance level, the coefficient is statistically significant at a X significance level. If the coefficient p-value is smaller than a X significance level, the coefficient is statistically significant at a X significance level. Table 56 presents standard t-values and p-values for specific significance levels, for two-tailed tests.

Table 56: Significance levels

Significance level	Confidence interval	T-values	P-values
10%	90%	> 1,65	< 0,1
5%	95%	> 1,96	< 0,05
1%	99%	> 2,57	< 0,01

Blindfolding is an interactive sample reuse technique that omits part of the data and uses the model to try to predict the omitted part of the data, being useful to assess the predictive relevance of the model (Hair et al., 2014).

d) Technology

SmartPLS 3, a software package for variance-based structural equation modelling using partial least squares (Ringle, Wende, & Becker, 2015), was the tool used in this research to process the questionnaire's responses. Table 57 shows the algorithms/techniques executed and the respective parameters used to run them.

Table 57: Used techniques and parameters

Algorithm/Technique	Parameters
PLS algorithm	Weighting scheme: path Maximum iterations: 3000 Stop criterion: 10^{-7}
Bootstrapping	Subsamples: 2000 Do parallel processing: Yes Sign changes: No sign changes Amount of results: Complete bootstrapping Confidence interval method: Bias-corrected and accelerated Bootstrap Test: two tailed Significance Level: 0,01

Algorithm/Technique	Parameters
Blindfolding	Omission Distance: 7

e) Results' assessment procedure

Table 58 presents the criterions and indicators used to assess the SEM model in detail. The first step is to assess the measurement models. The structural model will be assessed only if the measurement models' results are acceptable.

Table 58: Procedure to assess SmartPLS 3 results
Adapted from Hair et al. (2014)

Evaluation of the measurement models	
Reflective measurement models	Formative measurement models
• Internal consistency (Composite reliability and Cronbach's alpha) • Convergent validity (Outer loadings and AVE) • Discriminant validity (Cross-loadings and Fornell-Larcker test)	• Collinearity among indicators (VIF) • Significance and relevance of outer weights
Evaluation of the structural model	
• Collinearity issues (VIF) • Significance of the structural model relationships (Path coefficients) • Coefficient of determination • f^2 effect sizes • Predictive relevance • q^2 effect sizes	

4.3.11.2 Assessment of the reflective measurement models of the lower-order components

Table 59 summarizes the indicators used to assess the reflective measurement models.

Table 59: Result from reflective measurement models' assessment

Latent Variable	Reflective Indicators	Convergent Validity		Internal Consistency		Discriminant validity
		Indicator reliability (Outer loadings)	AVE	Composite reliability	Cronbach Alpha	
Content Management	I-02	0,896***	0,793***	0,884***	0,739***	Yes
	I-03	0,885***				
Policies	I-04	0,855***	0,688***	0,897***	0,846***	Yes
	I-05	0,849***				
	I-06	0,711***				
	I-07	0,890***				
Utilization guidance	I-08	0,920***	0,765***	0,907***	0,846***	Yes
	I-09	0,825***				
	I-10	0,877***				
Encouragement initiatives	I-13	0,927***	0,859***	0,924***	0,835***	Yes
	I-14	0,926***				
Objectives	I-15	0,972***	0,938***	0,968***	0,934***	Yes
	I-17	0,965***				
Utilization knowledge	I-19	0,974***	0,937***	0,968***	0,933***	Yes
	I-20	0,963***				
Communication Immediacy	I-29	0,790***	0,653***	0,850***	0,738***	Yes
	I-30	0,794***				
	I-31	0,840***				
Enjoyment	I-33	0,951***	0,909***	0,952***	0,900***	Yes
	I-34	0,956***				
Working feeling	I-35	-0,030	0,299	0,28	0,760***	Yes
	I-36	0,772**				
Informal language	I-37	0,776***	0,770***	0,909***	0,855***	Yes
	I-38	0,927***				
	I-39	0,922***				
Professional environment	I-40	0,933***	0,817***	0,931***	0,894***	Yes
	I-41	0,914***				
	I-81	0,864***				
Critical mass	I-42	0,922***	0,866***	0,928***	0,845***	Yes
	I-45	0,939***				
Platform accessibility	I-46	0,938***	0,879***	0,935***	0,862***	Yes
	I-47	0,937***				
Effort expectancy	I-51	0,937***	0,731***	0,887***	0,813***	Yes
	I-52	0,969***				
	I-53	0,613***				
Management support	I-54	0,842***	0,791***	0,883***	0,746***	Yes
	I-55	0,934***				

Latent Variable	Reflective Indicators	Convergent Validity		Internal Consistency		Discriminant validity
		Indicator reliability (Outer loadings)	AVE	Composite reliability	Cronbach Alpha	
Peers support	I-56	0,824***	0,709***	0,879***	0,794***	Yes
	I-57	0,869***				
	I-58	0,832***				
Noise	I-59	0,674***	0,620***	0,890***	0,846***	Yes
	I-60	0,849***				
	I-61	0,794***				
	I-62	0,738***				
	I-63	0,865***				
Time	I-64	0,958***	0,768***	0,868***	0,875***	Yes
	I-65	0,787***				
Confidence	I-67	0,808***	0,767***	0,908***	0,848***	Yes
	I-69	0,895***				
	I-70	0,920***				
Technological experience	I-71	0,858***	0,714***	0,908***	0,875***	Yes
	I-72	0,889***				
	I-73	0,718***				
	I-74	0,902***				
Value expectancy	I-75	0,952***	0,892***	0,961***	0,939***	Yes
	I-76	0,948***				
	I-77	0,933***				
Use	I-78	0,927***	0,854***	0,921***	0,829***	Yes
	I-79	0,921***				

* significance level 0,10%; ** significance level 0,05%; *** significance level 1%

Before undertaking in more a detailed analysis of the measurement model, it is important to refer that two items were previously eliminated and didn't entered in consideration on the assessment of the measurement models. I-50 was deleted due to a loading smaller than 0,40. The deletion of this item increased both the outer loadings of the remaining items I-46 and I-47 on the measurement model of the variable Platform accessibility and increased its internal consistency – the Cronbach's alpha increased from 0,664 to 0,862 and the composite reliability increased from 0,807 to 0,935. I-80 was deleted due to a lack of validity of the answers in the survey. Users were asked to introduce the number of hours they spend weekly on Yammer which resulted on disparate and not reliable values.

a) Internal consistency reliability

Internal consistency reliability can be assessed using Composite reliability and Cronbach's alpha measurements (Hair et al., 2014).

Composite reliability considers the different outer loadings of the indicator and varies between 0 and 1. Higher values indicate higher levels of reliability. Values between 0,60 and 0,70 are acceptable in exploratory research and values between 0.70 and 0.90 are considered satisfactory in more advanced studies, however, values above 0,95 may indicate problems in the content validity of the instrument (Hair et al., 2014). The results for composite reliability in this measurement model are higher than 0,80 for all the latent variables at a significance level of 99%. The exception is the latent variable Working feeling with a composite reliability of 0,282 (not significant: p-value = 0,318), much below the acceptable value of 0,60. From the results, shown in Table 59, it is possible to identify four LVs with composite reliabilities higher than 0,95 which possibly indicates problems of item redundancy. Even though this measurement model is new and was firstly applied in this research, what can be a reason for such high values of composite reliability (Hair et al., 2014), the instrument was reviewed and validated during Pre-test I and II and the values are relatively high for all LVs. Thereby, these values don't seem sufficient alarming to invalidate the measurement model for those variables.

Cronbach's alpha is an internal consistency indicator which provides an estimate of the reliability based on the intercorrelations of the observed indicator variables. This indicator assumes that all items are equally reliable, it is sensitive to the number of items in the measurement model of a specific LV and it tends to underestimate the internal consistency reliability. Cronbach's alpha is also perceived as a conservative measurement that shouldn't be considered alone when assessing the internal consistency reliability of an instrument (Hair et al., 2014). Even though, values above 0,70 are considered satisfactory. In this case, all the values, for all the LVs, are above that target and are statistically significant at a 99% confidence level (p value < 0,01).

b) Convergent validity

Convergent validity is the extent to which a measure correlates positively with alternative measures of the same construct. Indicator reliability (outer loadings) and the average variance extracted(AVE) are important measures to assess convergent validity (Hair et al., 2014).

Higher outer loadings on a construct indicate that the associated indicators have much in common, which is captured by the construct. An indicator outer loading should be higher than 0,70. In the measurement model, all the items have outer loadings above 0,70 - statistically significance for a confidence interval of 99%. The exception resides on indicators I-35 and I-36. Even though I-36 outer

loading is 0,772, the value is significance just for an interval confidence of 95%. I-35 has an outer loading of -0,030 which is a not statistically significant value (p value = 0,935).

Another common measure to establish convergent validity at the construct level is AVE. This value is obtained from the sum of the squared outer loadings of the items from a specific latent variable, divided the number of indicators. Values of 0,50 or higher indicate that, on average, the construct explains more than half of the variance of its indicators. AVE's are higher than 0,50 and statistically significant for a confidence interval of 99% for all LVs except Working feeling.

c) Discriminant validity

Discriminant validity is the extent to which a construct is truly distinct from other constructs by empirical standards. Thus, establishing discriminant validity implies that a construct is unique and captures phenomena not represented by other constructs in the model. The analysis of cross-loadings and the Fornell-Larcker criterion are two methods used to assess discriminant validity (Hair et al., 2014).

An item's outer loading on its construct should be higher than all its cross loadings on other constructs. The presence of cross loadings that exceed the indicator' outer loading represents a discriminant validity problem (Hair et al., 2014). It wasn't possible to identify any cross-loadings, see Appendix B - Items cross-loadings.

Fornell-Larcker criterion compares the square root of the AVE with the latent variable correlations. The square root of the AVE of each LV should be higher than its highest correlation with any other LV (Hair et al., 2014). From Table 60, all the square roots of the AVE are higher than any correlation with other constructs. As an example, the square root of the AVE of the LV Communication immediacy is 0,808. This value is higher than any correlation of the LV Communication immediacy with other LVs, that means that the remaining values on that column are lower than 0,808.

Therefore, discriminant validity is assured for all the latent variables in this measurement model.

Table 60: Results from Fornell–Larcker test

	Communication immediacy	Confidence	Content quality	Critical mass	Effort expectancy	Encouragement initiatives	Enjoyment	Informal language	Management support	Noise	Objectives	Peers support	Platform accessibility	Content management	Policies	Professional environment	Technological experience	Time	Use	Utilization guidance	Utilization knowledge	Value expectancy	Working feeling
Communication immediacy	0,808																						
Confidence	0,576	0,876																					
Content quality	0,506	0,462																					
Critical mass	0,502	0,418	0,328	0,930																			
Effort expectancy	0,306	0,419	0,359	0,209	0,855																		
Encouragement initiatives	0,347	0,146	0,202	0,433	0,068	0,927																	
Enjoyment	0,678	0,592	0,590	0,471	0,450	0,317	0,954																
Informal language	0,228	0,188	0,133	0,174	0,062	0,085	0,291	0,878															
Management support	0,342	0,193	0,185	0,407	0,065	0,467	0,226	0,036	0,889														
Noise	-0,241	-0,151	-0,413	-0,144	-0,165	-0,113	-0,447	-0,069	-0,014	0,787													
Objectives	0,599	0,574	0,530	0,398	0,462	0,250	0,646	0,252	0,226	-0,248	0,968												
Peers support	0,603	0,416	0,345	0,613	0,107	0,471	0,549	0,218	0,539	-0,202	0,412	0,842											
Platform accessibility	0,363	0,388	0,263	0,277	0,584	0,206	0,357	0,201	0,201	-0,064	0,425	0,236	0,937										
Content management	0,404	0,374	0,780	0,230	0,333	0,259	0,534	0,108	0,137	-0,384	0,388	0,294	0,213	0,890									
Policies	0,233	0,111	0,483	0,167	0,117	0,197	0,228	0,082	0,172	-0,290	0,247	0,230	0,166	0,499	0,829								
Professional environment	0,409	0,349	0,565	0,276	0,301	0,268	0,509	0,077	0,166	-0,283	0,440	0,265	0,173	0,530	0,327	0,904							
Technological experience	0,198	0,254	0,100	0,256	0,195	0,181	0,170	0,163	0,156	0,074	0,159	0,187	0,332	0,052	0,039	0,076	0,845						
Time	-0,479	-0,400	-0,434	-0,283	-0,411	-0,127	-0,602	-0,092	-0,105	0,525	-0,472	-0,396	-0,294	-0,342	-0,124	-0,235	-0,030	0,876					
Use	0,578	0,408	0,335	0,469	0,397	0,193	0,555	0,202	0,306	-0,185	0,480	0,470	0,435	0,196	0,062	0,198	0,254	-0,570	0,924				
Utilization guidance	0,307	0,129	0,244	0,299	0,051	0,476	0,272	0,129	0,332	-0,109	0,268	0,350	0,114	0,285	0,290	0,207	0,127	-0,138	0,176	0,875			
Utilization knowledge	0,300	0,388	0,301	0,106	0,588	0,062	0,251	0,081	0,101	0,025	0,492	0,127	0,461	0,311	0,243	0,222	0,293	-0,257	0,349	0,143	0,968		
Value expectancy	0,653	0,593	0,582	0,388	0,484	0,230	0,743	0,232	0,222	-0,375	0,660	0,534	0,380	0,517	0,272	0,436	0,132	-0,626	0,606	0,194	0,383	0,944	
Working feeling	0,222	0,276	0,301	0,111	0,231	0,121	0,340	0,182	0,024	-0,214	0,289	0,130	0,074	0,311	0,127	0,305	0,100	-0,264	0,147	0,103	0,125	0,379	0,546

Even though, LV Working feeling has good values for discriminant validity and an acceptable Cronbach's alpha value, the composite reliability and the AVE are very low. In a normal scenario, a loading bellow 0,40 is enough reason to delete an item from the measurement model, however, deleting I-35 implicates that Working feeling would only be measured using one single item, what brings negative implications on the content validity of the construct (Hair et al., 2014). Therefore, the necessary conditions to measure Working feeling are not in place and the right decision is to delete the variable from the structural model. All the other measurement models seem to have enough conditions to measure the variables in study.

4.3.11.3 Assessment of the formative measurement models of the lower-order components

Table 61 summarizes the indicators used to assess the formative measurement model.

Table 61: Result from formative measurement model's assessment

Latent variable	Formative Indictors	Outer weights	VIF
Content quality	I-21	0,544***	1,569
	I-24	0,345***	1,521
	I-27	0,326***	1,418

*** significance level 1%

a) Collinearity Issues

A characteristic from formative measurement models is the low correlation between the items. Therefore, high correlations or collinearity, can be an evidence of problems in the research methodological approach. Collinearity can be assessed with Variation Inflation Factor (VIF). A VIF higher than 5 indicate a potential collinearity problem (Hair et al., 2014).

Items I-21, I-24 and I-27 present VIF values below 5, which doesn't indicate any collinearity problems.

b) Significance and relevance of outer weights

Evaluating formative indicators outer weighs is a criterion to assess its relevance. Outer weight should be significantly different from zero (Hair et al., 2014). All the item I-21, I-24 and I-27 have significant outer weights (p-value < 0,01) different than zero.

4.3.11.4 Assessment of the measurement model of the higher-order components

a) Collinearity issues

This assessment examines each set of predictor variables separately for each endogenous variable in the model and intends to identify collinearity issues. Predictor variables should be distinctive from each other, thereby, in case of collinearity, the research should consider to deleted or merge constructs or create higher-order constructs (Hair et al., 2014). In the context of PLS-SEM, VIF values of 5 and higher, respectively, indicate a potential collinearity problem (Hair et al., 2014). Table 62 presents the results from VIF test.

Table 62: Results from VIF test

Latent variable	Content quality	Objectives	Utilization knowledge	Value expectancy	Use
Communication immediacy					2,543
Confidence					1,985
Content quality				1,598	
Critical mass					1,865
Effort expectancy					2,087
Encouragement initiatives					1,565
Enjoyment					3,613
Informal language					1,183
Management support					1,623
Noise				1,260	1,586
Objectives				1,697	
Peers support					2,769
Platform accessibility					1,819
Content management	1,332				
Policies	1,332				
Professional environment					1,509
Technological experience					1,223
Time					2,266
Use					

Utilization guidance		1,000	1,000		
Utilization knowledge				1,381	
Value expectancy					3,142

From Table 62, none of the VIF values is higher than 5, which means there are no indication of collinearity issues. Therefore, there is no need to make changes on the constructs (Hair et al., 2014).

b) Significance of the structural model relationships

Structural model relationships or path coefficients represent the hypothesized relationship among the variables. The path coefficients assume values between -1 and +1. More extreme values, that is values closer to -1 or +1, indicate stronger relationships among variables and values closer to 0 indicate weaker relationships. A positive path coefficient represents positive impact between the variables and a negative path coefficient represents a negative impact. When interpreting the results of a path model, it is also important to assess the significance of all structural model relationships (Hair et al., 2014). Table 63 presents the results from the path model significance test.

Table 63: Results from path model significance test

Path	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Communication immediacy → Use	0,193***	0,199	0,074	2,599	0,009
Confidence → Use	-0,145**	-0,142	0,067	2,153	0,031
Content quality → Value expectancy	0,254***	0,254	0,065	3,890	0,000
Critical mass → Use	0,199***	0,197	0,065	3,072	0,002
Effort expectancy → Use	0,022	0,022	0,076	0,284	0,776
Encouragement initiatives → Use	-0,114*	-0,105	0,062	1,835	0,067
Enjoyment → Use	0,098	0,085	0,108	0,905	0,366
Informal language → Use	0,023	0,027	0,048	0,474	0,635
Management support → Use	0,127**	0,123	0,063	2,004	0,045
Noise → Use	0,136**	0,128	0,057	2,378	0,018
Noise → Value expectancy	-0,164***	-0,172	0,055	2,997	0,003
Objectives → Value expectancy	0,438***	0,434	0,067	6,508	0,000
Peers support → Use	-0,040	-0,037	0,084	0,478	0,633
Platform accessibility → Use	0,124*	0,121	0,073	1,698	0,090
Content management → Content quality	0,718***	0,719	0,046	15,526	0,000

Path	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Policies → Content quality	0,124**	0,127	0,056	2,209	0,027
Professional environment → Use	-0,100	-0,094	0,067	1,486	0,137
Technological experience → Use	0,099*	0,109	0,055	1,783	0,075
Time → Use	-0,326***	-0,327	0,069	4,741	0,000
Utilization guidance → Objectives	0,268***	0,274	0,063	4,261	0,000
Utilization guidance → Utilization knowledge	0,143*	0,144	0,082	1,730	0,084
Utilization knowledge → Value expectancy	0,095	0,094	0,058	1,635	0,102
Value expectancy → Use	0,249**	0,248	0,098	2,548	0,011

* significance level 10%; ** significance level 5%; *** significance level 1%

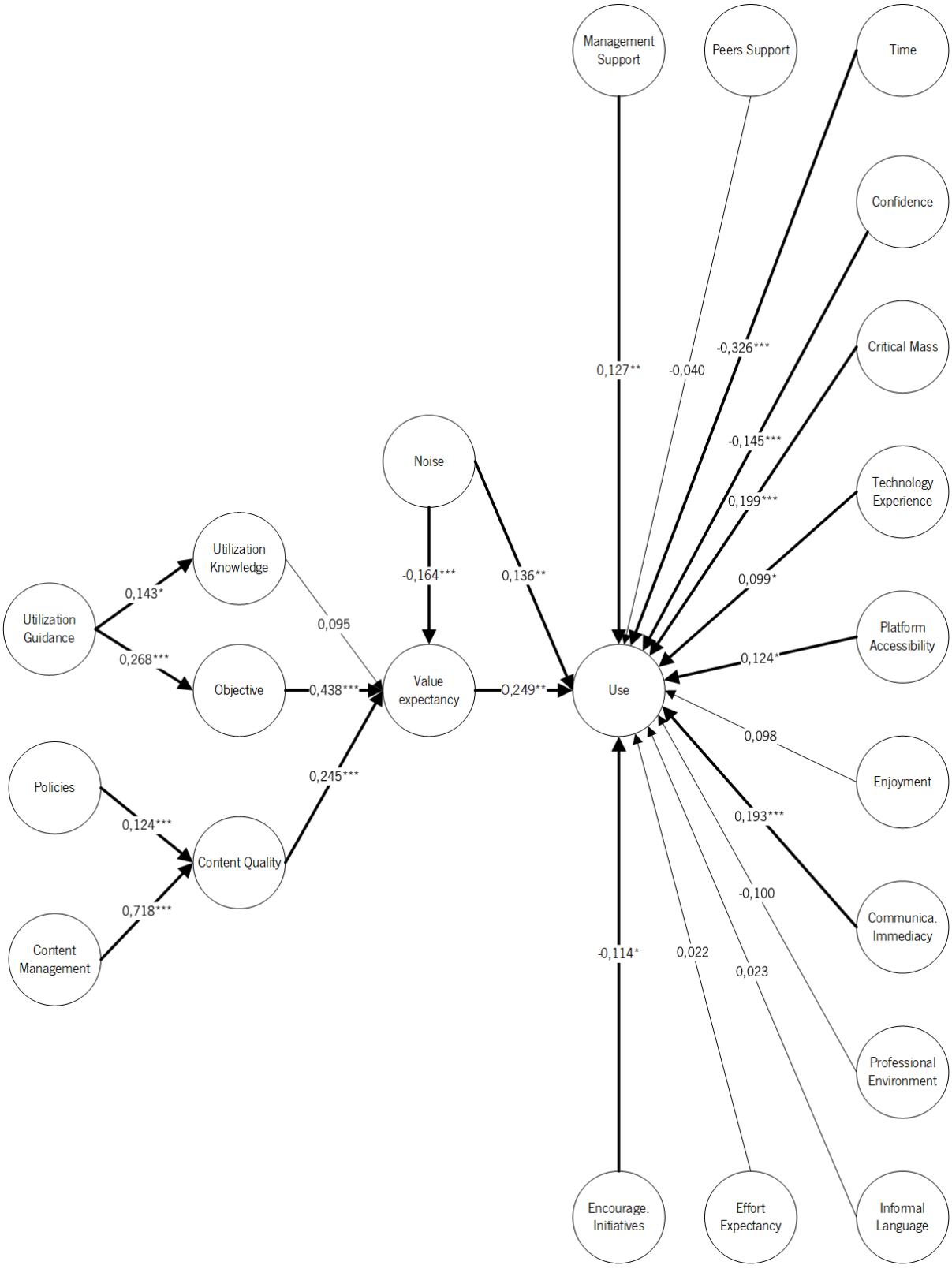
From Table 63, path coefficients Platform management → Content quality, Utilization guidance → Objectives, Content quality → Value expectancy, Noise → Value expectancy, Objectives → Value expectancy, Critical mass → Use, Time → Use and Communication immediacy → Use are significant at a significance level of 1%.

Path coefficients Policies → Content quality, Confidence → Use, Management support → Use, Noise → Use and Value expectancy → Use are significant at a significance level of 5%.

Path coefficients Utilization guidance → Utilization information, Utilization information → Value expectancy, Technological experience → Use, Usage incentives → Use are significant at a significance level of 10%.

Typically, lower significance levels indicate stronger relationships. * significance level 10%; ** significance level 5%; *** significance level 1%

Figure 23 represents the structural model. Ticker arrows represent significant path coefficients, for a significance level of 10%.



* significance level 10%; ** significance level 5%; *** significance level 1%

Figure 23: Path model

c) Coefficient of determination

The most commonly used measure to evaluate the structural model is the coefficient of determination - r^2. The coefficient represents the exogenous latent variables combined effects on the endogenous latent variable. It also represents the amount of variance in the endogenous constructs explained by all the exogenous constructs linked to it. r^2 varies from 0 to 1. A r^2 value of 0,75 is substantial, 0,5 moderate and 0,25 weak (Hair et al., 2014). Table 64 presents the coefficients of determination for the endogenous variables.

Table 64: Results from r^2 test

Latent Variable	R Square
Content quality	0,620***
Objectives	0,072**
Use	0,582***
Utilization knowledge	0,020
Value expectancy	0,535***

* significance level 10%; ** significance level 5%; *** significance level 1%

The Coefficients of determination of Content quality, Use and Value expectancy are moderate and significant for a confidence interval of 99%. As the goal of this research study was to explain the variance of Yammer use, a r^2 value of 0,582 means the effect of the exogenous variables connected to this variable explain 58,2% of its variance.

d) f^2 effect size

The effect size f^2 allows to assess the contribution of each exogenous latent variable in the coefficient of determination - r^2 - of the endogenous latent variables. This value is calculated by assessing the r^2 when a specified exogenous construct is omitted from the model. f^2 effect size values of 0,02 are small, 0,15 medium and 0,35 large (Hair et al., 2014). Table 65 presents the effect size values.

Table 65: Results from f^2 assessment

Latent variable	Content quality	Objectives	Utilization knowledge	Value expectancy	Use
Communication immediacy					0,035
Confidence					0,025
Content quality				0,087	
Critical mass					0,051

Latent variable	Content quality	Objectives	Utilization knowledge	Value expectancy	Use
Effort expectancy					0,001
Encouragement initiatives					0,020
Enjoyment					0,006
Informal language					0,001
Management support					0,024
Noise				0,046	0,028
Objectives				0,243	
Peers support					0,001
Platform accessibility					0,020
Content management	1,020				
Policies	0,030				
Professional environment					0,016
Technological experience					0,019
Time					0,112
Utilization guidance		0,077	0,021		
Utilization knowledge				0,014	
Value expectancy					0,047

From Table 65, the effect sizes of all the exogenous latent variables in Use are below 0,15 (f^2<0,15) and some of them even are below 0,02 (f^2<0,02). This can be due to the high number of LVs connected to the LV Use, as the effect spreads among them. Even though, the highest size effect on the coefficient of determination of Use is from the LV Time (f^2=0,112). Objectives has a medium size effect on Value expectancy (f^2=0,243) and Content Management a large effect on Content quality (f^2=1,020).

e) Predictive relevance

In addition to the evaluation of r^2 values, researchers frequently revert to the cross-validated redundancy measure Q^2 - Stonecrisser test - which has been developed to assess the predictive validity of the endogenous latent variables and can be computed using the blindfolding procedure. Q^2 blindfolding procedure represents a measure of how well the path model can predict the originally observed values. Q^2 values larger than zero for certain reflective endogenous latent variables indicate predictive relevance of the path model. This procedure does not apply for formative endogenous constructs. The cross-validated redundancy approach was followed as recommended by the authors (Hair et al., 2014). Table 66 presents the Q^2 values that resulted from the blindfolding procedure.

Table 66: Results from Q^2 test

Latent variable	SSO	SSE	Q^2 (=1-SSE/SSO)
Objectives	402,000	161,933	0,597
Use	402,000	223,815	0,443
Utilization knowledge	402,000	160,904	0,600
Value expectancy	603,000	198,405	0,671

Q^2 values presented in Table 66 are higher than zero for all endogenous LVs which means that the exogenous constructs have predictive relevance on the endogenous constructs under consideration.

f) q^2 effect sizes

In addition, q^2 effect size measures the relative impact of predictive relevance of each exogenous latent variable in the endogenous constructs. To calculate the relative impact of predictive relevance of a specific exogenous LV in a specific endogenous LV, it is needed to execute the blindfolding procedure with the exogenous LV included in the model and, then, with the same LV excluded from the model, in order to get the two different Q^2 values for the endogenous LV. The following formula is used to assess q^2 values (Hair et al., 2014):

$$q^2 = \frac{{Q^2}_{included} - {Q^2}_{excluded}}{1 - {Q^2}_{included}}$$

Table 67 presents q^2 effect sizes on the endogenous latent variables. According to Hair et al. (2014) values of 0,02, 0,15, and 0,35 indicate, respectively, small, medium or large predictive relevance of an exogenous variable on an endogenous variable.

Table 67: Results from q^2 assessment

Latent variable	Objectives	Utilization knowledge	Value expectancy	Use
Communication immediacy				0,012
Confidence				0,005
Content quality			0,053	
Critical mass				0,032
Effort expectancy				-0,005
Encouragement initiatives				0,007

Latent variable	Objectives	Utilization knowledge	Value expectancy	Use
Enjoyment				0,000
Informal language				0,004
Management support				0,009
Noise			0,027	0,012
Objectives			0,161	
Peers support				-0,002
Platform accessibility				0,007
Professional environment				-0,002
Technological experience				0,011
Time				0,075
Utilization guidance	-	-		
Utilization knowledge			0,004	
Value expectancy				0,023

Critical mass, Time and Value expectancy have a small predictive relevance on Use. Objectives and Content quality have a medium predictive relevance on Value expectancy. It was not possible to calculate the q^2 effect size of Utilization guidance on Utilization Knowledge and Objectives because Utilization guidance was the only exogenous variable connected to those variables. When the variable Utilization guidance was excluded from the model, Utilization knowledge and Objectives became regular exogenous variables of the model. Q^2 values are characteristic of endogenous variables, therefore, it was not possible to retrieve $Q^2{}_{excluded}$ values in this situation and, consequently, to calculate the q^2 effect size of Utilization guidance in both variables.

4.3.11.5 Hypothesis analysis

Table 68 indicates which hypothesis are supported from the findings. A hypothesis was considered supported when the path coefficients associated with the hypothesis achieve significance levels equal or lower than 10%, see Table 63. Even though hypothesis H2c, H12b and H14c have significant path coefficients, the directionality of the impact is the opposite to the one proposed and, thereby, they were considered as not supported. Hypothesis H1a, H2a, H2c, H3b and H6b are formulated slightly different from the way they appear formulated in Table 33. The reason resides on the fact that during Pre-test and improvements phase, see section 4.3.7, some of the variables names were changed

and, consequently, hypothesis designations suffered changes as well. However, IDs are still the same from the ones presented in Table 33.

Table 68: Hypothesis support

ID	Hypothesis	Path coefficients	Supported?
H1a	Better content management will positively impact Content quality.	0.718***	Yes
H1b	Policies enforcement will positively impact Content quality.	0.124**	Yes
H2a	Utilization guidance will positively impact Utilization knowledge	0.143*	Yes
H2b	Utilization guidance will positively impact Objectives understanding	0.268***	Yes
H2c	Encouragement initiatives will positively impact Use	-0.114*	No
H3a	Understanding of platform objectives will positively impact Value Expectancy	0.438***	Yes
H3b	Utilization knowledge will positively impact Value Expectancy	0.095	No
H4	Content quality will positively influence Value Expectancy	0.254***	Yes
H5	Communication immediacy will positively impact Yammer use	0.193***	Yes
H6a	A professional environment will positively impact Use	-0.100	No
H6b	An Informal language will positively impact Use	0.023	No
H6c	Enjoyment will positively impact Use	0.098	No
H6d	Perceiving Yammer as a working platform will impact Use	-	Not tested
H7	Critical mass will positively impact Use	0.199***	Yes
H8	Platform accessibility will positively impact Use	0.124*	Yes
H9	Lower effort expectancy will positively impact Use	0.022	No
H11a	Peer support will positively impact Use	-0.040	No
H11b	Management support will positively impact Use	0.127**	Yes
H12a	Noise will negatively impact Value Expectancy	-0.164***	Yes
H12b	Noise will negatively impact Use	0.136**	No
H14a	Lack of Time will negatively impact Use	-0.326***	Yes
H14b	Language knowledge will positively impact Use	-	Not tested
H14c	Confidence will positively impact Use	-0.145**	No
H15a	Technology experience will positively impact Use	0.099*	Yes
H17	Value expectancy will positively impact Use	0.249**	Yes

* significance level 10%; ** significance level 5%; *** significance level 1%

4.4 Discussion

The results from model assessment are positive. The reflective measurement models were assessed for convergent validity, internal consistency and discriminant validity and the formative measurement model for collinearity issues and significance and relevance. The structural model relationships showed significance and the model predictive relevance. The model explains 58,2% of Use variance.

As supported by the research, if the Value Expectancy – extent to which users perceive Yammer as being a useful tool from which they can benefit if they use it - precedes Yammer use (H17), the outcome a user expects from using Yammer is important when making the decision to use the tool or not. Therefore, it is important to increase this value expectancy and the organization seems to have an important role on that, not only by ensuring users understand the objective of using Yammer (H3a), but also by assuring the content quality of the platform (H4).

The variable objectives – extent to which users understand Yammer objectives – influences Value Expectancy positively (H3a), which means users that understand the objectives behind Yammer introduction have higher expectations from using it. Adding to this, Utilization Guidance has a positive effect in Objectives(H2b) and Utilization Knowledge (H2a), so users that were introduced to the tool have better understanding of Yammer objectives and higher knowledge about how to use the tool. It becomes important that users receive information and support about Yammer when they firstly contact with the tool.

On the other side, content management (H1a) and policies enforcement (H1b) are important to ensure Yammer content quality. While content management has the goal to ensure the relevance, structure and up-to-dateness of content through a set of corrective actions as deletion of irrelevant content, policies enforcement establishes the rules of the platform, by defining the expected behaviour from users on the network. The combination of these two dimensions of action are significant to have content with quality in the network.

Noise acts as a disabling factor to Value Expectancy (H12a). That means that the existence of several software applications to perform work activities, several communications platforms and an overflow of information reduces the value expected from using Yammer. Introducing a new platform in such environment will increase the existent complexity and, therefore, users won't expect higher outcomes from using the tool. Clearly defining the scope of each platform and re-aligning the information sources seems to be important to mitigate the problem.

Management Support (H11b) and Critical Mass (H7) affect the Use positively. Having the support from the management and the feeling people around are also using the platform enables Yammer use. Critical Mass depends on the level of adoption of the technology, but managers can be promotors of the tool as they seem to influence users. Thereby, the organization shall educate managers and prepare them to support and motivate their subordinates to use the tool.

Adding to this, higher Communication Immediacy (H5) also assumes an important role on the process as one of the main goals of the tool in to create connections between people. If people react positively to communication immediacy, it gets important to get questions answered and to provide feedback to others.

On the other side, the easiness accessing Yammer (H8), independently of the network or device, and the individuals' technological experience also affects Yammer use. Indeed, individuals with higher experience with messaging tools or social networks seem to use Yammer more. If the technology experience is something intrinsic to the individual, Yammer accessibility can be managed by the organization. Depending on the technological infrastructure of the company, the integration level of the tool and the identity management system in place, the organization shall enable the possibility to access Yammer independently of the network of the user and the platform he or she is using. The goal is each user to be able to access the network every time they need it.

From the research, Time was the strongest influencer of Use (H14a). The lack of time, possibly due to busy work routines, hampers the use of the platform. Even though ESN has an important role in the context of multinational organizations, when time needs to be very well managed due to busy schedules, engaging in conversations on Yammer or scrolling through the network to see the initiatives developed in other locations doesn't seem to be a likely decision. Thereby, the organization should educate their employees to the importance of participating in the network. To assign specific time slots in employees' agendas for using the tool can be an important step if time is indeed the main obstacle.

Results have also shown three significant variable relations with opposite polarity from the one hypothesized. That's the case of the impact of noise (H12b), encouragement initiatives (H2c) and confidence in use (H14c).

From the qualitative research, encouragement initiatives were perceived as an enabling factor for Yammer use, however, theory testing found that the encouragement initiatives are a disabling factor for Yammer use. A possible explanation can be that people felt a lot of pressure to use Yammer due to

these encouragement initiatives, what may have resulted in resistance to the tool. On the other side, people that use the tool, as something natural to use and potentially embodied in their work routines, don't have such strong feelings etched in their memories, which results neither in strong negative or positive positions about these encouragement initiatives. Independently of ambiguity, the organization needs to carefully develop these initiatives as they can have unwanted negative effects.

The effect of noise in the use, from theory testing, seems to be positive. This can be potentially explained as people that use Yammer have the highest awareness about the existent noise in the organization. On the other side, least confident people seem to use Yammer the most which contrasts with the initial hypothesis. This result can possibly be explained due to an overall lack of confidence expressing opinions in Yammer. As the items were developed to assess the confidence using the platform, people that don't use it so extensively may have resorted in more neutral opinions, while people that use it the most only showed this trend of lack of confidence. Thereby, even though this specific result can be a little ambiguous, the organization should always foster an open environment where everyone feels free to comment and share their opinions.

Findings from this research support and are supported by findings from previous research initiatives.

In accordance with Rogers (1995), the individual decision for innovation adoption is a process of five stages. By comparing the results from research with Rogers' stages, it becomes obvious that actions in the scope of utilization guidance would be important in knowledge phase, when users are exposed to the innovation, because individuals need to clearly understand what is the advantage of using it, and the support from management would also be a good add-on in persuasion phase, as users look for reinforcement of their ideas.

Aspects related with platform accessibility, critical mass, communication immediacy and content quality would be significant in the decision and following phases. All these aspects would be part of the equation to decide for the adoption. And then, these same aspects could not only lead to confirmation of the decision, but also to dissatisfaction or discontinuance of the ESN, in case the expectations were not being met.

Results are also in line with findings from Frambach & Schillewaert (2002) as utilization guidance, content management, policies enforcement and management support fit in the category "Organizational facilitators/Internal marketing" from the model proposed for individual innovation

acceptance. Critical mass is related with the category “Social Usage” and technology experience related with “Personal Characteristics” category. However, while Frambach & Schillewaert (2002) focus mainly in the aspects influencing the innovation acceptance, this research initiatives addresses the usage of the innovation, more precisely Yammer.

When comparing findings with AUCT model, from Brown et al (2010b), in the context of collaboration technology use, it is possible to understand that Social Presence, Immediacy, Collaboration Technology experience, Superior Influence and Technology Facilitating Conditions are, directly or indirectly, also influencers of Yammer use.

The influence of Platform Accessibility, Communication Immediacy, Management Support, Utilization Guidance, Critical Mass, Technology Experience and Value Expectancy in use have also been identified by C. P.-Y. Chin et al. (2015), in the context of an Australian company.

5. CONCLUSION

5.1 Contributions and implications

Part I contributes for ESN literature by providing a description of the adoption and introduction process of Yammer in the context of a multinational organization. The process was described in detail recurring to interviews of people involved in the process and historical data. It is common a lack of examples of ESN introduction processes in the literature, so this kind of description can be very useful to support organizations in their own introduction processes. A difficulty in these exercises of documentation of past initiatives is the assessment of the undertaken actions. In this case, findings from Part II provide a clue to assess some of the most impactful actions from Part I, however, an introduction process like the one described in Part I, divided in different phases with different approaches, makes the assessment of outcomes even harder. On the other side, the lack of reports of ESN introduction processes also hinders the hypothesis to create comparative analysis on the introduction process and its outcomes.

Part II highlights a set of factors that influence Yammer usage. Because the results are likely to be extrapolated, they are also valuable to understand the factors influencing ESN usage overall. Along the past decades, the problem of adoption and use of technology has been highly studied, however there is still missing a more structured approach to understand the issue in the context of ESN. This research initiative can be a good starting point to develop a global model of adoption and use of these technologies. A model with sufficient descriptive power, capable of being applied in the context of several organizations.

One of the biggest contributions of this master thesis was to show the active role of the organization in the process of ESN use by answering the research question – "How does ESN adoption and introduction process, at organizational level, influences ESN use, at individual level?". When analysing Yammer introduction process in the organization and the set of factors that influence Yammer use, it was possible to highlight that connection. During the process of introduction of Yammer there was few information about how the process should be carried out, but this study showed that individuals that were guided through the platform have higher platform outcomes expectations and tend to use it more.

Although the organization has a direct or indirect influence in a set of factors that influence Yammer use, the connection between Utilization guidance, Objectives, Value expectancy and Use expresses a very important link between the organizational efforts promoting usage and the individual use. Not less relevant, the connection Policies enforcement/Content management, Content quality, Value

Expectancy and Use also expresses the importance of background organizational actions, in this case actions that promote the content quality of the platform, in Yammer use.

Therefore, when we go back to the adoption and introduction process of Yammer in this multinational organization, it is possible to understand that several initiatives that were developed can be classified as utilization guidance or policies enforcement initiatives. All the communication plans, training initiatives and awareness documentation can be perceived as important steps to introduce the platform to the users in order to promote Yammer usage. The development of a code of conduct and success criteria for group owners can be perceived as good approaches to promote not only a correct usage of the tool, but also a good management of Yammer groups in order to obtain good content quality on the platform. On the other side, management can be important confirming individuals' decision to use the platform, platform accessibility and communication immediacy are enablers of Yammer use and time can be a heavy disabler. Organizations should develop specific actions to deal with these factors as well. The impact of time in use was the biggest among all the factors, so the organization needs to carefully address this issue and develop ideas to increase the level of integration of Yammer in simple work routines. Users shouldn't perceive the platform as a burden.

From the interviews conducted in Part I, changing the focus to the users by explaining them the benefits they could get from using Yammer was perceived as one of the most successful actions undertaken. Findings from Part II corroborate this perception as Value expectancy was found out to be an important precedent of Yammer use. The development of guidelines that expressed the benefit a sales agent could get by using Yammer or the advantage of Yammer for someone working in internal communication were, therefore, successful steps in the journey of introducing Yammer.

In summary, this research initiative provides meaningful insights into the adoption and introduction process of a ESN in the context of a multinational organization. The information presented in this master dissertation can be very useful for other organizations planning to adopt similar technologies not only when developing a set of activities to be executed, but also to foresee potential difficulties during the process. Not less important, this research also focus on the factors influencing the individual usage of ESN. This document provides interesting extracts from users' interviews that show their perceptions and worries about the ESN in study and extrapolates them to the global organization through the conduction of a survey. This research initiative is a good contribution for a quite young research field that is still in development.

5.2 Limitations

The study was conducted in the context of a single multinational organization. Even though results are likely to be extrapolated to other organizations that intend to introduce ESN, a comparative study between several organizations would be important to understand the phenomenon at a broader level. The organizational context in very complex, which means there are different factors influencing not only the ESN adoption and introduction, at organizational, level but also ESN use, at individual level. Therefore, it is expected that depending on the organization, different factors influencing this process may show up.

On the other side, the process of ESN adoption and implementation process was not analysed while it was happening (that happened only for the last phase), but documented resorting to descriptions and perceptions retrieved from user interviews and historical documentation. Although some information might be not completely accurate, every time it was possible, several sources of information were used.

Adding to this, the survey was also not responded by a representative sample of users. It is true that the final set of respondents showed to be quite diverse (sex, age, location and work function), however there are some limitations when generalising the results for all the organization.

When it comes to relate both parts of this research study, some limitations arise. If even in experimental research with highly controlled environments, sometimes it is difficult to relate causes and consequences, in this research scenario, to make those connections becomes even harder. Due to a lack of similar studies and the impossibility to assess the impact of a specific action, the solution found was to indicate probable positive and impactful actions undertaken in the past, after the evaluation of user's responses in the survey.

Nevertheless, limitations were countered and results are meaningful to answer the research question and to support organizations in the future.

5.3 Recommendations

Findings from this research initiative allow to develop a set of recommendations for organizations that intend to initiate ESN's introduction processes.

Strategic alignment: before deciding to adopt an ESN, the organization needs to assess the reasons behind such idea and the advantages the technology would bring for the company. The introduction of a ESN needs to be fully aligned with the organizational strategy, as its expected for this

technology not only to help achieving a strategic goal, but also help employees in their work routines and needs. The analysis of ESN used in other companies and conversations with suppliers can be important to understand the potentialities of these technologies. A clear definition of expected outcomes is important for future assessments of the importance and usefulness of the tool.

Organizational fit: an ESN is a tool that can be used for numerous purposes, therefore, each organization needs to foresee how the technology will be used in the organization to help achieving the strategic goals behind its introduction. Will it be a tool just to enable connections among employees or to share top-down communication announcements across the organization? The agreement on the organizational fit is essential not only to define how the tool should be structured and managed, but also to guide users in what is expected from them when they use the tool. Not always it is easy to understand the organisational fit of a tool even when there are solid strategic goals behind it. The conduction of small pilots with a low number of users can de useful to understand how they react to the tool and how will they use it. One learning from this study was that users sometimes find alternative ways of usage that were not expected and, thereby, giving them freedom for testing the tool can be an interesting step to identify usage scenarios that can be valuable to achieve the strategy behind the tool introduction.

Technical set-up: Before rolling out a tool to the entire organization, it is important to ensure that the technical set-up is on place. An ESN should be fully integrated with the technological infrastructure of the organization as another tool would be. Each user should be able to login in the network independently of the network or device in use, in order to increase platform accessibility.

Communication, Awareness and Support: when an ESN is introduced in an organization it is essential that users clearly understand the objectives behind its introduction and the value they can expect from using it. A tool shouldn't be perceived as a burden in a complex technological landscape. The fact these technologies are social networks, and social networks are mainly used in private life for ludic purposes can increase the confusion. It wouldn't be difficult to find people arguing against the introduction of tool just for that fact. The development of communication plans, awareness campaigns and simple trainings events are essential to explain users what is expected from the tool, how should they behave on it and the benefit the tool brings for their work routines.

Leading by example: there are enthusiastic users that might start using the tool right away, but there are also users that will resist to use it. The process of individual innovation adoption, among other factors, takes time, however, the organization should promote the expected behaviour in the network. Thereby, top, middle and low management should engage with the tool and lead by giving the example.

Positive reinforcement actions by not leaving questions without answer, like posts and comments, praise and acknowledge other users achievements are important to encourage users' participation.

Platform management: depending on the way the ESN is being used in the organization, it is important to have a set of good practices to ensure the quality of platform's content in the dimensions structure, relevance and up-to dateness. Each group in the ESN should have a manager who ensures that the content produced is relevant to the purpose of the group and should guarantee that the interaction inside the group keeps high. On the other side, aspects as group naming conventions should be defined as well to keep some order in the platform and to strengthen the search engines potential.

Openness: In an interactive and collaborative tool such as an ESN, users should feel free to engage in discussions, give opinions and interact with users independently of their locations or position in the hierarchy. The organization should promote an open environment to enable that collaboration. The basis for the value of ESN comes from user participation and interaction among users.

Track the success of the network: a social network lives from user participation, so it is important to have a solid engaged user base in the platform. Tracking the evolution on number of members, engaged members and overall interaction indicators on the network in aspects like number of comments, likes or shared documents is useful to assess the health of the network. There are analytic tools available in the market for that purpose. However, some of the success comes from the business value of the network and business value can be hard to assess as it usually doesn't translate in indicators on those analytic tools. A strategy to assess some of that success is to undertake in more qualitative approaches and interview very active users on the network or analyse network groups that seem to be very used by users. Success assessment is essential to understand if the strategic expected outcomes are being met or not.

5.4 Final Considerations

The increasing importance of collaboration inside and across organizations leads to the increasing use of collaboration technologies. The use of ESN follows this trend and, thereby, it will be every time more common to see these technologies being introduced in organizations.

This study is an add-on to the research fields of ESN and ESN adoption and use by providing important findings around these topics with a strong practical applicability. However, it becomes important for other researchers to extend these findings in future research initiatives.

The work presented in this document was useful to develop a strategic plan for Yammer, in LSA, for the coming years.

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7. APPENDIX A - QUESTIONNAIRE

Finish Cancel

Sex *

- Male
- Female

Age *

In which country do you work? *

In which professional group do you fit? *

Platform climate
Rate each question using the scale provided: 1- Strongly disagree; 2- Disagree; 3- Undecided; 4- Agree; 5- Strongly agree *

	Strongly disagree		Undecided		Strongly agree
	1	2	3	4	5
• I use informal language with peope I collaborate, on Yammer	○	○	○	○	○
• The process of participating in Yammer is enjoyable.	○	○	○	○	○
• I use informal language to interact on Yammer	○	○	○	○	○
• People use informal language to interact on Yammer	○	○	○	○	○
• I have fun using Yammer	○	○	○	○	○
• People keep a professional conduct on Yammer	○	○	○	○	○
• I think Yammer environment is professional	○	○	○	○	○
• I feel I´m doing a break when I use Yammer	○	○	○	○	○
• I feel I´m not working when I use Yammer	○	○	○	○	○
• People have a professional behaviour on Yammer	○	○	○	○	○

Social presence and interaction immediacy
Rate each question using the scale provided: 1- Strongly disagree; 2- Disagree; 3- Undecided; 4- Agree; 5- Strongly agree *

	Strongly disagree		Undecided		Strongly agree
	1	2	3	4	5
• When someone posts on Yammer, usually I give feedback quickly	○	○	○	○	○
• Of the people I regularly interact with, many use Yammer	○	○	○	○	○
• When I post on Yammer, usually I get feedback quickly	○	○	○	○	○
• Yammer enables me to quickly reach work partners	○	○	○	○	○
• Many people I work with, use Yammer.	○	○	○	○	○

Objectives
Rate each question using the scale provided: 1- Strongly disagree; 2- Disagree; 3- Undecided; 4- Agree; 5- Strongly agree *

	Strongly disagree		Undecided		Strongly agree
	1	2	3	4	5
• I understand why to use Yammer	○	○	○	○	○

• I understand the objective of using Yammer	○	○	○	○	○

Usability
Rate each question using the scale provided: 1- Strongly disagree; 2- Disagree; 3- Undecided; 4- Agree; 5- Strongly agree *

	Strongly disagree		Undecided		Strongly agree
	1	**2**	**3**	**4**	**5**
• I am not able to use Yammer when I need it due to access problems	○	○	○	○	○
• Using Yammer requires a lot of mental effort	○	○	○	○	○
• Using Yammer is easy for me	○	○	○	○	○
• I think Yammer is easy to use	○	○	○	○	○
• I don't have problems accessing Yammer through different devices	○	○	○	○	○
• I don't have problems accessing Yammer through different networks	○	○	○	○	○

User and work environment
Rate each question using the scale provided: 1- Strongly disagree; 2- Disagree; 3- Undecided; 4- Agree; 5- Strongly agree *

	Strongly disagree		Undecided		Strongly agree
	1	**2**	**3**	**4**	**5**
• I feel confident asking questions in Yammer	○	○	○	○	○
• It's difficult to keep up with all the information I receive	○	○	○	○	○
• I feel there are too many information sources inside the organization	○	○	○	○	○
• I don't have time to use Yammer	○	○	○	○	○
• There are too many communication platforms in the organization	○	○	○	○	○
• Using Yammer takes a lot of time	○	○	○	○	○
• There are too many platforms I need to use to perform my activities	○	○	○	○	○
• I feel there is an overflow of information in the organization	○	○	○	○	○
• I feel confident expressing my opinion in Yammer	○	○	○	○	○
• Overall, I feel confident to interact in Yammer	○	○	○	○	○

Technological experience
Rate each question using the scale provided: 1- None at all; 2- Little; 3- Average; 4- Extensive; 5- Very extensive *

	None at all		Average		Very extensive
	1	**2**	**3**	**4**	**5**
• My experience with social networks is:	○	○	○	○	○
• My experience with social collaboration tools is:	○	○	○	○	○
• My experience with messaging tools (e.g., whatsapp) is:	○	○	○	○	○
• My experience with technologies similar to Yammer is:	○	○	○	○	○

Social support, guidance and encouragement intiatives
Rate each question using the scale provided: 1- Strongly disagree; 2- Disagree; 3- Undecided; 4- Agree; 5- Strongly agree *

	Strongly disagree		Undecided		Strongly agree
	1	**2**	**3**	**4**	**5**
• My co-workers think I should use Yammer	○	○	○	○	○

• I believe the top management would like me to use Yammer	○	○	○	○	○
• Someone guided me when I started to use Yammer	○	○	○	○	○
• The organization developed initiatives to encourage user participation (create posts, upload documents, images or videos, like and comment) on Yammer	○	○	○	○	○
• My supervisor expects that I use Yammer	○	○	○	○	○
• I received guidance about Yammer when I started to use it	○	○	○	○	○
• The organization developed initiatives on Yammer to encourage Yammer use	○	○	○	○	○
• My peers think I should use Yammer	○	○	○	○	○
• My friends think I should use Yammer	○	○	○	○	○
• I received information about Yammer when I started to use it	○	○	○	○	○

Utilization knowledge
Rate each question using the scale provided: 1- Strongly disagree; 2- Disagree; 3- Undecided; 4- Agree; 5- Strongly agree *

	Strongly disagree		Undecided		Strongly agree
	1	**2**	**3**	**4**	**5**
• I understand how to use Yammer	○	○	○	○	○
• I know how to use Yammer	○	○	○	○	○

Content quality and management
Rate each question using the scale provided: 1- Strongly disagree; 2- Disagree; 3- Undecided; 4- Agree; 5- Strongly agree *

	Strongly disagree		Undecided		Strongly agree
	1	**2**	**3**	**4**	**5**
• There are policies regarding content production on Yammer	○	○	○	○	○
• I respect specific policies when I use Yammer	○	○	○	○	○
• Yammer content is being well managed	○	○	○	○	○
• The content of Yammer is relevant	○	○	○	○	○
• The content of the Yammer groups I follow is being well managed	○	○	○	○	○
• There are policies regarding group creation	○	○	○	○	○
• The content of Yammer is up to date	○	○	○	○	○
• There are policies regulating Yammer use	○	○	○	○	○
• The content of Yammer is structured	○	○	○	○	○

Value and benefits
Rate each question using the scale provided: 1- Strongly disagree; 2- Disagree; 3- Undecided; 4- Agree; 5- Strongly agree *

	Strongly disagree		Undecided		Strongly agree
	1	**2**	**3**	**4**	**5**
• I will get some benefits by using Yammer	○	○	○	○	○
• I will get some return by using Yammer	○	○	○	○	○
• I think Yammer is useful for my job	○	○	○	○	○

Usage
Rate the question using the scale provided: 1- Very light; 2- Light; 3- Undecided; 4- Heavy; 5- Very heavy *

	Very light		Average		Very heavy
	1	2	3	4	5
• I rate my intensity of use of Yammer to be	○	○	○	○	○

• How frequently do you use Yammer? *

On an average week, how much time (in hours) do you use Yammer? *

Have you been involved in the creation or management of a Yammer group? *

○ Yes
○ No

Do you have any comments about the survey or your experience using Yammer?

Finish Cancel

8. APPENDIX B - ITEMS CROSS-LOADINGS

	Content Management	Policies	Utilization guidance	Encouragement initiatives	Objectives	Utilization knowledge	Content quality	Communication Immediacy	Enjoyment	Working feeling	Informal language	Professional environment	Critical mass	Platform accessibility	Platform effort expectancy	Management support	Peers support	Noise	Time	Confidence	Technology experience	Value expectancy	Use
I-02	0,896	0,576	0,282	0,255	0,352	0,292	0,711	0,362	0,481	0,270	0,118	0,488	0,221	0,198	0,263	0,155	0,308	-0,369	-0,270	0,345	0,043	0,450	0,137
I-03	0,885	0,307	0,224	0,206	0,339	0,262	0,678	0,357	0,470	0,284	0,073	0,454	0,189	0,180	0,332	0,087	0,213	-0,313	-0,341	0,321	0,049	0,470	0,213
I-04	0,400	0,855	0,255	0,192	0,188	0,106	0,438	0,184	0,211	0,149	0,057	0,292	0,130	0,051	0,046	0,130	0,225	-0,310	-0,090	0,072	0,031	0,237	0,030
I-05	0,437	0,849	0,219	0,152	0,238	0,272	0,384	0,242	0,222	0,039	0,094	0,282	0,180	0,195	0,115	0,176	0,234	-0,197	-0,143	0,136	0,030	0,282	0,103
I-06	0,382	0,711	0,173	0,111	0,198	0,257	0,348	0,175	0,141	0,124	0,030	0,240	0,055	0,182	0,192	0,117	0,092	-0,158	-0,065	0,089	0,086	0,169	0,056
I-07	0,438	0,890	0,302	0,188	0,200	0,192	0,423	0,176	0,178	0,108	0,088	0,270	0,179	0,139	0,055	0,149	0,199	-0,277	-0,112	0,076	-0,008	0,211	0,024
I-08	0,252	0,261	0,920	0,458	0,270	0,125	0,211	0,284	0,261	0,087	0,122	0,188	0,266	0,096	0,041	0,298	0,295	-0,097	-0,107	0,151	0,135	0,160	0,156
I-09	0,253	0,224	0,825	0,366	0,192	0,189	0,229	0,225	0,181	0,112	0,088	0,163	0,239	0,125	0,106	0,211	0,252	-0,002	-0,060	0,086	0,066	0,163	0,112
I-10	0,242	0,278	0,877	0,421	0,237	0,054	0,201	0,298	0,272	0,072	0,129	0,194	0,281	0,078	-0,017	0,368	0,381	-0,197	-0,204	0,094	0,131	0,190	0,199
I-13	0,248	0,180	0,409	0,927	0,240	0,097	0,192	0,350	0,312	0,145	0,088	0,238	0,351	0,181	0,071	0,373	0,425	-0,062	-0,087	0,139	0,173	0,222	0,180
I-14	0,232	0,185	0,473	0,926	0,222	0,017	0,182	0,293	0,276	0,079	0,069	0,258	0,452	0,201	0,054	0,493	0,449	-0,148	-0,149	0,132	0,162	0,204	0,178
I-15	0,381	0,232	0,267	0,234	0,972	0,456	0,517	0,579	0,634	0,305	0,255	0,440	0,385	0,381	0,452	0,227	0,400	-0,266	-0,482	0,566	0,140	0,671	0,484
I-17	0,371	0,247	0,252	0,250	0,965	0,498	0,508	0,582	0,616	0,252	0,233	0,410	0,386	0,446	0,442	0,211	0,398	-0,213	-0,429	0,544	0,169	0,604	0,445
I-19	0,301	0,236	0,138	0,058	0,517	0,974	0,297	0,315	0,276	0,160	0,088	0,251	0,092	0,443	0,605	0,071	0,131	-0,003	-0,286	0,373	0,273	0,404	0,336
I-20	0,302	0,235	0,139	0,062	0,427	0,963	0,284	0,261	0,205	0,075	0,066	0,173	0,116	0,451	0,528	0,129	0,114	0,055	-0,205	0,380	0,297	0,332	0,340
I-21	0,665	0,337	0,209	0,176	0,512	0,273	0,889	0,455	0,523	0,303	0,131	0,521	0,244	0,201	0,287	0,137	0,256	-0,336	-0,405	0,399	0,036	0,573	0,324
I-24	0,667	0,503	0,230	0,197	0,337	0,223	0,789	0,325	0,422	0,179	0,047	0,414	0,248	0,211	0,268	0,152	0,258	-0,361	-0,304	0,331	0,151	0,370	0,151
I-27	0,579	0,387	0,156	0,117	0,414	0,231	0,751	0,449	0,492	0,229	0,141	0,426	0,337	0,248	0,342	0,178	0,359	-0,323	-0,333	0,400	0,088	0,440	0,326
I-29	0,403	0,156	0,301	0,370	0,561	0,159	0,483	0,790	0,630	0,309	0,212	0,380	0,497	0,226	0,235	0,330	0,499	-0,208	-0,433	0,433	0,186	0,587	0,465
I-30	0,260	0,223	0,254	0,315	0,408	0,257	0,361	0,794	0,462	0,068	0,144	0,277	0,397	0,279	0,159	0,321	0,518	-0,152	-0,306	0,401	0,092	0,464	0,378
I-31	0,310	0,194	0,199	0,179	0,476	0,306	0,381	0,840	0,541	0,147	0,190	0,327	0,335	0,365	0,322	0,201	0,459	-0,214	-0,408	0,543	0,186	0,526	0,535
I-33	0,479	0,212	0,242	0,292	0,661	0,266	0,551	0,644	0,951	0,310	0,293	0,492	0,440	0,375	0,448	0,214	0,529	-0,398	-0,564	0,593	0,172	0,697	0,513

	Content Management	Policies	Utilization guidance	Encouragement initiatives	Objectives	Utilization knowledge	Content quality	Communication Immediacy	Enjoyment	Working feeling	Informal language	Professional environment	Critical mass	Platform accessibility	Platform effort expectancy	Management support	Peers support	Noise	Time	Confidence	Technology experience	Value expectancy	Use
I-34	0,538	0,222	0,276	0,312	0,574	0,215	0,573	0,650	0,956	0,337	0,263	0,479	0,458	0,308	0,411	0,217	0,518	-0,453	-0,583	0,539	0,153	0,720	0,545
I-35	-0,053	-0,078	-0,001	-0,102	-0,074	-0,067	-0,062	-0,074	0,024	-0,030	0,177	-0,160	-0,065	0,020	-0,022	-0,084	-0,019	0,033	0,159	0,003	-0,035	0,007	-0,053
I-36	0,212	0,051	0,081	0,031	0,182	0,056	0,199	0,129	0,284	0,772	0,257	0,139	0,046	0,072	0,169	-0,035	0,090	-0,148	-0,108	0,220	0,057	0,304	0,083
I-37	0,084	0,056	0,094	0,009	0,181	0,122	0,087	0,163	0,224	0,150	0,776	0,074	0,082	0,132	0,116	-0,005	0,096	-0,123	-0,099	0,079	0,058	0,185	0,107
I-38	0,068	0,034	0,097	0,110	0,213	0,034	0,112	0,216	0,246	0,105	0,927	0,042	0,173	0,209	0,033	0,074	0,234	-0,026	-0,064	0,183	0,164	0,211	0,197
I-39	0,130	0,121	0,144	0,077	0,261	0,082	0,143	0,213	0,293	0,226	0,922	0,093	0,177	0,175	0,046	0,011	0,208	-0,065	-0,092	0,200	0,174	0,215	0,202
I-40	0,445	0,261	0,186	0,246	0,417	0,192	0,475	0,385	0,484	0,270	0,059	0,933	0,234	0,171	0,261	0,163	0,252	-0,224	-0,221	0,283	0,065	0,418	0,227
I-41	0,543	0,334	0,219	0,254	0,433	0,211	0,571	0,390	0,476	0,298	0,125	0,914	0,263	0,153	0,298	0,145	0,245	-0,317	-0,217	0,351	0,080	0,401	0,161
I-81	0,473	0,322	0,151	0,226	0,322	0,212	0,514	0,321	0,405	0,264	0,016	0,864	0,271	0,136	0,269	0,137	0,215	-0,241	-0,195	0,341	0,061	0,349	0,113
I-42	0,284	0,199	0,326	0,461	0,427	0,102	0,354	0,505	0,470	0,133	0,166	0,302	0,922	0,280	0,181	0,400	0,625	-0,167	-0,290	0,387	0,239	0,396	0,410
I-45	0,153	0,117	0,236	0,352	0,320	0,096	0,262	0,433	0,410	0,077	0,158	0,217	0,939	0,239	0,207	0,360	0,521	-0,104	-0,239	0,391	0,238	0,330	0,460
I-46	0,190	0,144	0,127	0,238	0,389	0,416	0,222	0,340	0,363	0,067	0,175	0,132	0,275	0,938	0,528	0,186	0,219	-0,100	-0,313	0,381	0,315	0,381	0,408
I-47	0,208	0,167	0,087	0,149	0,408	0,448	0,270	0,341	0,305	0,072	0,202	0,192	0,245	0,937	0,566	0,190	0,224	-0,019	-0,237	0,347	0,307	0,331	0,406
I-51	0,343	0,131	0,023	0,070	0,412	0,617	0,345	0,281	0,410	0,179	0,070	0,286	0,195	0,564	0,937	0,050	0,107	-0,122	-0,344	0,380	0,215	0,455	0,368
I-52	0,330	0,147	0,100	0,077	0,484	0,591	0,374	0,333	0,447	0,229	0,070	0,334	0,236	0,588	0,969	0,121	0,131	-0,139	-0,401	0,438	0,196	0,471	0,419
I-53	0,112	-0,066	-0,042	-0,004	0,235	0,156	0,135	0,104	0,272	0,211	-0,014	0,068	0,043	0,259	0,613	-0,089	-0,020	-0,230	-0,335	0,204	0,029	0,289	0,161
I-54	0,175	0,165	0,214	0,325	0,165	0,117	0,208	0,174	0,175	-0,009	-0,042	0,209	0,255	0,153	0,102	0,842	0,360	-0,013	-0,101	0,145	0,118	0,176	0,210
I-55	0,089	0,148	0,353	0,481	0,229	0,073	0,139	0,395	0,221	0,041	0,082	0,109	0,438	0,198	0,029	0,934	0,566	-0,013	-0,089	0,193	0,155	0,215	0,318
I-56	0,301	0,218	0,361	0,346	0,352	0,104	0,323	0,544	0,498	0,178	0,218	0,251	0,491	0,173	0,104	0,319	0,824	-0,191	-0,327	0,348	0,124	0,467	0,371
I-57	0,213	0,174	0,305	0,481	0,387	0,118	0,260	0,532	0,471	0,135	0,158	0,285	0,572	0,227	0,106	0,523	0,869	-0,144	-0,307	0,381	0,171	0,474	0,412
I-58	0,234	0,191	0,222	0,358	0,302	0,099	0,293	0,450	0,419	0,019	0,179	0,133	0,482	0,196	0,061	0,509	0,832	-0,177	-0,366	0,321	0,175	0,409	0,402
I-59	-0,293	-0,170	0,047	0,045	-0,141	-0,027	-0,297	-0,123	-0,279	-0,228	-0,017	-0,263	-0,048	-0,032	-0,213	0,093	-0,076	0,674	0,428	-0,138	-0,007	-0,279	-0,156
I-60	-0,313	-0,266	-0,158	-0,125	-0,252	-0,005	-0,335	-0,220	-0,358	-0,185	-0,037	-0,230	-0,131	-0,047	-0,134	-0,062	-0,196	0,849	0,449	-0,120	0,022	-0,350	-0,168
I-61	-0,265	-0,214	-0,074	-0,054	-0,174	0,052	-0,347	-0,182	-0,365	-0,176	-0,140	-0,177	-0,116	-0,061	-0,119	0,055	-0,163	0,794	0,416	-0,098	0,065	-0,303	-0,160
I-62	-0,251	-0,200	-0,110	-0,146	-0,181	0,045	-0,245	-0,116	-0,331	-0,125	0,027	-0,219	-0,132	-0,056	-0,109	-0,045	-0,080	0,738	0,309	-0,146	0,182	-0,210	-0,033

	Content Management	Policies	Utilization guidance	Encouragement initiatives	Objectives	Utilization knowledge	Content quality	Communication Immediacy	Enjoyment	Working feeling	Informal language	Professional environment	Critical mass	Platform accessibility	Platform effort expectancy	Management support	Peers support	Noise	Time	Confidence	Technology experience	Value expectancy	Use
I-63	-0,373	-0,275	-0,129	-0,179	-0,217	0,043	-0,373	-0,273	-0,422	-0,117	-0,074	-0,231	-0,141	-0,058	-0,074	-0,097	-0,240	0,865	0,429	-0,106	0,082	-0,299	-0,165
I-64	-0,325	-0,120	-0,135	-0,112	-0,468	-0,255	-0,426	-0,481	-0,590	-0,215	-0,090	-0,252	-0,269	-0,260	-0,338	-0,125	-0,414	0,472	0,958	-0,384	-0,008	-0,607	-0,621
I-65	-0,276	-0,094	-0,102	-0,120	-0,336	-0,183	-0,318	-0,329	-0,446	-0,289	-0,069	-0,126	-0,227	-0,276	-0,443	-0,029	-0,237	0,480	0,787	-0,313	-0,067	-0,475	-0,289
I-67	0,376	0,178	0,178	0,119	0,460	0,298	0,431	0,480	0,477	0,221	0,162	0,272	0,322	0,274	0,319	0,142	0,349	-0,186	-0,326	0,808	0,234	0,479	0,315
I-69	0,243	0,026	0,091	0,120	0,498	0,285	0,319	0,487	0,484	0,230	0,161	0,275	0,381	0,325	0,304	0,172	0,358	-0,049	-0,280	0,895	0,186	0,477	0,313
I-70	0,358	0,090	0,082	0,142	0,541	0,416	0,451	0,541	0,580	0,268	0,170	0,355	0,390	0,403	0,453	0,190	0,383	-0,154	-0,424	0,920	0,243	0,585	0,425
I-71	0,088	0,137	0,139	0,099	0,131	0,237	0,133	0,141	0,182	0,119	0,173	0,113	0,202	0,276	0,169	0,073	0,128	0,018	-0,010	0,237	0,858	0,115	0,138
I-72	0,069	0,053	0,151	0,151	0,131	0,262	0,104	0,198	0,142	0,088	0,164	0,052	0,210	0,265	0,136	0,133	0,182	0,074	-0,011	0,263	0,889	0,146	0,221
I-73	-0,026	-0,071	0,065	0,094	0,002	0,131	0,007	0,044	-0,013	0,072	0,132	-0,024	0,155	0,237	0,102	0,057	0,032	0,204	0,096	0,119	0,718	-0,026	0,090
I-74	0,028	0,003	0,080	0,208	0,187	0,294	0,076	0,205	0,185	0,075	0,114	0,081	0,262	0,326	0,215	0,190	0,203	0,037	-0,081	0,212	0,902	0,133	0,297
I-75	0,489	0,253	0,161	0,187	0,586	0,343	0,554	0,626	0,719	0,368	0,229	0,395	0,335	0,338	0,467	0,181	0,468	-0,366	-0,589	0,576	0,106	0,952	0,573
I-76	0,460	0,242	0,161	0,186	0,601	0,345	0,498	0,593	0,673	0,323	0,223	0,374	0,358	0,338	0,457	0,215	0,486	-0,301	-0,561	0,574	0,122	0,948	0,548
I-77	0,511	0,273	0,223	0,273	0,677	0,393	0,591	0,629	0,711	0,380	0,205	0,459	0,403	0,397	0,448	0,232	0,553	-0,390	-0,618	0,532	0,144	0,933	0,592
I-78	0,223	0,074	0,178	0,199	0,449	0,332	0,335	0,566	0,528	0,128	0,184	0,247	0,444	0,388	0,375	0,294	0,460	-0,177	-0,525	0,430	0,283	0,606	0,927
I-79	0,137	0,040	0,147	0,157	0,439	0,313	0,283	0,500	0,497	0,145	0,189	0,116	0,423	0,416	0,358	0,272	0,408	-0,164	-0,529	0,323	0,185	0,513	0,921