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The potential of implementing Enterprise Social Networks in Portuguese companies

A study about the views of employees and managers of Portuguese companies about social networks for the enterprise

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ABSTRACT

The potential of implementing Enterprise Social Networks in Portuguese companies

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The objective of this study is to understand what is the potential of successfully implementing enterprise social networks in the workplace of Portuguese companies. This dissertation aims to understand if employees and managers of Portuguese companies see the advantages of having access to enterprise social software, if they believe this technology fits their job requirements, and if they are likely to use and implement it in their companies.

In order to answer the main questions of this dissertation, an online survey is conducted within companies from different sectors. This survey is built based on the literature review around enterprise social technology and enterprise 2.0, as well as the theoretical model of Dishaw and Strong (1999). To provide insights, a statistical analysis was made to the survey results, including descriptive statistics, mean comparisons and multivariate linear regressions.

According to the results of this study, the majority of employees are not using enterprise social networks in the workplace. Also, although most of employees require management promotion to adopt the technology, the majority states that these tools are adequate to their job needs and acknowledge its advantages. Besides, the majority of managers state an intention to use the tool and implement it in the future, since they acknowledge advantages and fit to tasks.

This dissertation thus shows that enterprise social networks have an opportunity to be present in the infrastructure of Portuguese organizations, especially in companies with significant co-worker and partner volume of contact and with employees and managers who understand the value of accessing this technology.

Keywords: Enterprise Social Networks, Social Software, Enterprise 2.0, Web 2.0, Implementation of Enterprise Social Networks, Portuguese companies, Yammer

Table of Contents

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I want to use this final paragraph to remind myself there was a time I could've dropped my thesis to pursue different passions. I am glad I didn't.

André Albuquerque

When an organization reaches a certain stage in its development, instead of developing like a self-organizing string quartet, it becomes more like an orchestra whose disparate sections now need a conductor.

Brown and Duguid (2001)

Being the richest man in the cemetery doesn't matter to me … Going to bed at night saying we've done something wonderful… that's what matters to me

Steve Jobs

I. Introduction

This dissertation is about the potential implementation, perceived utility and likelihood of utilization of Enterprise Social Networks (Di Micco et al 2009) in companies in Portugal.

Social networks, which were already experiencing significant traction in the consumer universe by 2005 (Rosenbush, 2005), were first adapted into the business context by the IBM research project referred as *Beehive (*Farzan et al, 2008). From 2008 onwards, several vendors started developing their "social networks for the enterprise" solutions, which became a component of the Enterprise Social Software offered by these providers (Perez, 2008). At the same time, whole vendors were developing products to follow the demands of the market, programming capabilities developed at a faster pace (Fulkerson, 2009). Enterprise social technology evolved from a static environment, enriched by the capacity of development of the vendor, to be an organic and dynamic environment, growing through the users, and embedding new technologies based in business intelligence, real time communication (McLellan, 2013).

Enterprise Social Software evolved from the use of emergent social software platforms by a company to achieve goals (McAfee, 2009). Deconstructing this definition, E2.0 is a collaborative process (Social) achieved by technology software (Software) in a connected digital environment (Platform) in an unstructured form, guided by user interaction to shape the utility of the technology (Emergent) (McAfee, 2009).

The growth of young generations entering the workforce, with a daily usage of social networks in a consumer perspective will be significant enough to impact their business and co-worker interactions (Sitaram, 2010). Since Enterprise 2.0 is a business approach to Web 2.0 applications (Soariano et al, 2007), this new workforce will naturally request social tools to efficiently perform their work in a recognizable environment (Sitaram, 2010), but due to privacy and intellectual property concerns from companies, usage of consumer tools is not

recommended (Sitaram, 2010). Considering the evolution of business contact, collaboration between employees and necessities of communication with customers and suppliers, intranet collaboration (also referred as Silos) became inefficient and delaying the time of access to knowledge (Gburzynski, 2011).

According to the boom of consumer social media, a strong impact and transition for the enterprise universe throughout the coming years is expected, with Enterprise Social Networking and Enterprise Social Applications growing to $4.5B in 2016, with a CAGR of 42.4% (IDC, 2012). A second report, by Markets and Markets[1] predicts a market value of $6.2B in 2018, with a CAGR of 44.9%. Both reports demonstrate how unclear and potential is the scale of new clients, services and solutions and how this market will manage sustainability in the future (IDC, 2012), but it is assumed that this significant growth demonstrates a global implementation by companies. Large incumbents in the technology world are already catching up with the opportunities in this market, where leading companies such as Yammer or Vitrue are being acquired for $1.2 Billion and $300 Million, respectively (Naeve, 2013).

Also, enterprise social networks are expected to grow more than 8 times until 2018[2], a fact already being reflected in the leading companies so far: Yammer grew from 1 million users in nearly 80.000 paying companies[3] in 2010 to 7 million users in more than 200.000 companies in 2013[4]. In 2012, just in 3 months Yammer grew from 4 million to 5 million new users[5]. Other leading enterprise social network vendors[6] such as Jive claim to be growing more than 30% a year[7], now boasting more than 13 million paying users[8]. Even Chatter.com, the latest Salesforce enterprise social network product, launched

[1] http://www.marketsandmarkets.com/Market-Reports/enterprise-social-software-market-568.html
[2] http://www.prnewswire.com/news-releases/enterprise-social-softwarenetworking-market-worth-618-billion-by-2018-190994581.html
[3] http://venturebeat.com/2010/07/20/yammer-1-million-users/
[4] http://www.geekwire.com/2013/yammer-tops-7m-users-sales-spike-microsoft-deal/
[5] http://www.bizjournals.com/sanfrancisco/print-edition/2012/05/11/yammer-capitalizes-on-employee.html?page=all
[6] http://mashable.com/2012/08/15/business-social-enterprise-technologies/
[7] http://www.oregonlive.com/silicon-forest/index.ssf/2013/02/jive_software_fourth_quarter_r.html
[8] http://www.sramanamitra.com/2011/10/11/jives-ipo-prospects/

globally in 2011[9] reached more than 150.000 paying companies and 5 million employees.

Considering the growing statistics of this technology in companies around the world, this work aims to understand if Portuguese companies offer the same opportunity and present the drivers for social networks for the enterprise to be implemented. This study also aims to understand the potential fit of this technology to these employees' and managers' job requirements.

In order to offer insights to this topic, this dissertation seeks to answer the following questions regarding the implementation of enterprise social networks in Portuguese companies and the views of their employees and managers:

RQ1. Are current Portuguese companies using any enterprise social networks to connect employees internally?

RQ2. Are employees aware of this technology, its advantages and do they believe it fits their jobs?

RQ3. Is management aware of the advantages of this technology and is it willing to implement enterprise social networks within their companies?

In order to address the research question, this work develops a methodology based on Dishaw and Strong's integration of the technology acceptance model and the task-technology fit model (Davis, 1985, Goodhue & Thompson, 1995, Dishaw & Strong, 1999). This methodology uses the constructs by the authors to understand the potential fitness of the technology to employees' tasks and the probable acceptance of the technology in the workplace. Based on the model, the authors and the literature review, this study proposes 3 hypotheses:

H1: Tasks from Portuguese employees are adjusted to the functionalities provided by enterprise social networks

H2: Employees in Portuguese companies acknowledge the advantages and the functionalities of enterprise social networks and would use them, if available in the workplace.

[9] http://www.cio.com.au/article/375068/salesforce_com_launches_chatter_com_globally/

H3: Managers at Portuguese companies are aware of the value of having enterprise social networks in the workplace and have plans to implement it in the future.

The methodology developed to validate these hypotheses and answer the research questions is supported by an online survey, conducted within multiple companies across different sectors. This primary data, which offers direct feedback from potential future users of the technology, is complemented by secondary data from academic papers on topics such enterprise technology, cloud technology and employee performance. The targeted respondents of the survey are divided between employees and managers, and are not discriminated based on their specific role in each company or sector.

1.1 Structure

The structure of the dissertation is the following: first there is the literature review and state of the art on topics such as web 2.0, enterprise 2.0 and enterprise social networks, mobility in the enterprise and corporate adoption and implementation of technologies. The literature review also presents Davis' model (1985), Goodhue & Thompson.'s theory (1995) and Dishaw and Strong's model (1999) since they are further used to sustain the model answering the research questions. Next there is a *Methodology Research* chapter, which is divided in 4 sections: the construction of the model based on the previously mentioned authors, the proposed hypotheses and description of the variables, the three sub-dimensions that connect the online survey to the referred hypothesis, and consequently the research questions and finally the survey and ranking methodology. After the *Methodology Research* chapter there is the *Discussion* chapter, where the survey and some intermediary conclusions to the study are presented. To end the dissertation, there is the *Conclusions* chapter, where the validation to the hypothesis and answers to the research questions are presented. Also in the last chapter some limitations to this study are highlighted as well as topics for future research.

II. State of the Art

2.1 Chapter introduction

This chapter covers the main theoretical topics that led to the rise of enterprise social networks as an answer to connectivity, productivity and collaboration. The chapter starts with web 2.0 and its components and advantages for consumers, as well as the transition to enterprise 2.0 and the presence of this technology in companies. Next, enterprise 2.0 definitions and advantages for enterprises and employees are presented, following a general panorama of the adoption of this technology and its mobility. These topics allow introducing enterprise social networks as a key tool for companies to differentiate in the fields of productivity, collaboration and communication.

To end the chapter, the integrated theory of technology acceptance model with task-technology fit constructs is presented, offering an answer to the impact on performance after the implementation of a new technology in the workplace, considering the adaptation to the task-needs of employees.

2.2 Web 2.0

This sub-section demonstrates the theory behind web 2.0 and the transition of technology into a collaborative environment. Passing through the advantages of web 2.0 tools, this sub-section ends in the transition of web 2.0 from a consumer universe to an enterprise universe.

2.2.1 Definitions and Origins of Web 2.0

Web 2.0 was first studied in detail by Tim O'Reilly (2005), who defined it as the "network as a platform", connecting all devices and application, delivering

software “over the air” in a continually-updated service where quality grows in parallel to the use of participants and the remix of data from various sources. Murugesan (2007) defined Web 2.0 as “people-centric and collaborative knowledge-based”, where the social features support the bridge from Web 1.0. Other authors focused more on the flexibility, real-time and scalability characteristics versus the traditional software solutions (Grossman & McCarthy, 2007), and the participative architecture that evolves and is re-designed by the participation of users, rather than rigid pre-packaged software (O’Reilly, 2005 cited in Koch, 2008).

According to O’Reilly (O’Reilly, 2005), all that is written about Web 2.0 is based on the seven principles that differentiate applications powered by the Web:

2.2.1.1 The Web as a Platform

Applications and software belonging to the Web 2.0 are characterized by its distribution through the web instead of local servers. This “platform” allows websites to interact, returning pages with content to any device with web-reading capabilities. Applications become the core value-adding service for users, relegating web browsers and servers into a commodity status.

As later studied by Murugesan (2007), the people-centric design of Web 2.0 merges with the data generation and organization. As O’Reilly states “using the web-as-a-platform should be leveraged by centring the customer and offering value with algorithmic analysis of gathered data.”(O’Reilly, 2005).

2.2.1.2 Harnessing Collective Intelligence

Using the Web as a Platform to aggregate data generated the second principle: the harnessing of intelligence from large collaborative groups. To collect and aggregate this information, Web 2.0 uses tools such as hyper linking, product databases, content directories, collective editable platforms and collaborative categorization. The value and quality of this intelligence is as valuable as the size

of the network, especially if it is done with a homogeneous purpose (O'Reilly, 2005).

2.2.1.3 Data is the Next Intel Inside

One of the main points of Web 2.0 applications is the control of the database and the method to parse the data, since the insights emerging from combining sets of information is the only way to create value. Therefore, there are several tools that enable this parsing, such as web crawls, directories, product, listing or content databases (O'Reilly, 2005).

2.2.1.4 End of the software release cycle

As stated in the "Web as a platform" segment, Web 2.0 software shifts its distribution method to a service deployed over the web rather than packaged software. This forces providers to update and maintain their products on a daily basis, increasing not only the quality of the software but also reducing the necessities of updates. Companies using Web 2.0 solutions benefit both from the higher quality provided, but also from reducing the necessities of purchasing or implementing new technology (O'Reilly, 2005).

2.2.1.5 Lightweight programming models

Lightweight programming languages led to the creation of lightweight business models (services from Web 2.0 companies supported by Ads), as well as the concept "innovation in assembly", where value can be created by assembling components, who are now commoditized, in new ways (O'Reilly, 2005).

2.2.1.6 Rich User Experiences

Web 2.0 is empowering new uses of rich user experiences. Providers are now considering not only mobile or platform usage but also design patterns and elements focused on the utilization by clients (O'Reilly, 2005).

Considering the principles as well as the reach of Web 2.0 applications, Jandos adjusts O'Reilly's interpretation by stating that the economic and social shift is fuelled by a new way of thinking, network openness to collaboration and a new business adoption of software (O'Reilly, 2005 cited in Jandos, 2009).

2.2.2 Tools of Web 2.0

To achieve the architecture of participation and collaborative environment within Web 2.0 applications (O'Reilly, 2005), the technology evolved to focus on communication, peer connection and collective content reading, writing and editing (Murugesan, 2007, Bughin, 2008).

According to Bughin (2008), Gilchrist (2007) and Murugesan (2007), the key tools that comprise Web 2.0 are:

2.2.2.1 Blogs

Blogs are editable content-broadcasting web pages, where administrators or writers build and develop content and participants interact in a read/comment environment. Blogs are linked to their content, targeting different web users depending on interest of information (Gilchrist, 2007). Blogs are the earliest forms of knowledge sharing (Bughin, 2008), and the blogosphere is the community of bloggers who hyperlink and reference themselves in order to share and improve their own content quality (Murugesan, 2007)

2.2.2.2 Wikis

Wikis are collaborative-authoring platforms that allow storing knowledge and editing or removing contents by anyone using the service. Wikis require large amounts of users in order for its contents to be updated, and the quality of each topic is linked with the participants in the universe of the respective wiki (Gilchrist, 2007). Wikis are key tools for modern knowledge management technology due to the integration of features that focused, not only on the

amount and quality of information, but the capacity of searching and categorizing by the users (Murugesan, 2007).

2.2.2.3 RSS (Really Simple Syndication)

RSS is composed of web feed formats that allow users to syndicate to contents from information providers, such as blogs, wikis or personal pages. Users follow the feeds related to their interests, in order to have the contents served in a summarized form. This way of content distribution allows to organize knowledge and for users to have a real-time access to the latest information available (Murugesan, 2007).

2.2.2.4 Mashups

Web Mashups are pages that combine information from multiple sources as well as functionalities and data from several applications, generally through API's (Murugesan, 2007). Meshing up these disconnected services allows creating new value for consumers since different capabilities from these multiple sources can be leveraged to develop a new approach to content distribution (Gilchrist, 2007).

2.2.2.5 Folksonomy, Tags and Cloud Tags

Folksonomy is the information organization methodology for user-created content (Murugesan, 2007). With the new influx of content, applications require flexible categorization, and crowd collaboration offers not only higher quality, but also it becomes the only way to organize information as fast as the growth of Web 2.0 content platforms (Grossman & McCarthy, 2007). By applying easy categorization mechanics in information-rich platforms, tagging becomes a collaborative process. The combination of these tags forms the Tag Cloud, a visualization of all the tags in a page, based on each tag's popularity (Murugesan, 2007).

2.2.2.6 Social Networks

Social Networks are defined as applications that allow a continuous maintenance of relationships, such as virtual or real relationships, interest-based or necessity-based connections, among others (van Zyl, 2009). Social Networks enable users to manage their digital presence, mashing up capabilities from several applications in the web, especially based on communication and discovery (van Zyl, 2009). Social Networks are also used to tie all capabilities of Web 2.0 and to connect users to these capabilities, so that knowledge and experience can be shared (van Zyl, 2009).

2.2.3 Advantages of Web 2.0

According to Murugesan (2007) and Grossman & McCarthy (2007), the key advantages of Web 2.0 are resumed in *Section 1 - Table 1*.

2.2.4 Web 2.0 to Enterprise Web 2.0

A Cisco report (Cisco Collaboration, 2010) indicates that companies start to take advantage of the existence of consumer Web 2.0 in the work place, especially due to the enhanced communication technology present in these services. This Enterprise Web 2.0 (Jandos, 2009) takes advantage of the social and interactive tools offered by these consumer products to impact significant areas in marketing, sales or customer care (Cisco Collaboration, 2010). As an example, Omnicom's advertising agency's revenues grew more than 25% solely by adapting Web 2.0 tools in their sales and creative workflow; or P&G, which decreased by 30% the innovation costs by allowing employees to work through adjusted Web 2.0 applications within the company (Cisco Collaboration, 2010). But privacy and information security in companies is different from the consumer universe, and Enterprise Web 2.0 can compromise sensitive data (Jandos, 2009).

2.2.5 Enterprise Web 2.0 to Enterprise 2.0

Enterprise 2.0 emerges as the evolution of Enterprise Web 2.0, or the application of Web 2.0 in a business context (Soriano et al, 2008). Applications that fully transition to the Enterprise 2.0 universe are required to consider privacy and information management issues, business goals and context as well as corporate processes (Soriano et al, 2008).

Some reasons that led employees to adopt Web 2.0 technology in the workplace were, among others, to increase the speed of communication, to increase the effectiveness of customer care, marketing and information, to enhance the relationship with external parties such as partners, suppliers or clients and to access the right knowledge at the right time (Jandos, 2010). To address all these issues, new features emerged both in the consumer and the enterprise universe, such as pod casting, video sharing or micro-blogging (Jandos 2010).

2.3 Enterprise 2.0

This sub-section focus on the theory behind the introduction of web 2.0 technologies in companies, also called enterprise 2.0, starting with its definitions and tools, going through the mobility of the technology and finishing in the advantages for companies and employees.

2.3.1 Definitions and Origins of Enterprise 2.0

Enterprise 2.0 was first described and defined by Andrew McAfee as “the use of emergent social software platforms within companies, or between companies and their partners or customers” (McAfee, 2006). Other authors went deeper and defined it as “a set of organisational and technological approaches steered to enable new organisation models based on open involvement, emergent collaboration, knowledge sharing, internal/ external social network development and exploitation.” (Corso et al, 2008).

The social focus, central in Enterprise 2.0, derives directly from the Internet

creation and the World Wide Web development in 1989, where the main concern was connectivity of users with real time communication (Cook, 2008). Before Enterprise 2.0 being adopted, companies relied on traditional enterprise software which was supported by two distinct infrastructures: channels, such as email and internal instant messaging, where many can create the information, but consumption is limited; and platforms, such as portals and internal forums, where few contribute with information, but the whole organization has access. This structure has limitations, both in scale as well as access to quality of information (McAfee, 2006).

Enterprise 2.0 is built to integrate social technology in the workplace, where participants develop, communicate, share and use knowledge within the company (Corso et al, 2008). It takes advantage of desired attributes from Web 2.0 solutions, specially based on the harness of collective intelligence and the participative architecture of the platform to empower the knowledge sharing (Soriano et al, 2008).

2.3.2 Components of Enterprise 2.0

According to McAfee, social software is a subset of the Web 2.0 designed and implemented to support human behaviour through technology. McAfee states that, to achieve this premise, Enterprise 2.0 is defined by 6 components: SLATES.

2.3.2.1 Search

Search is the feature that allows finding relevant information on a web platform or database. According to McAfee (2006), the crowd-sourced categorization (tags powered by the Folksonomy) is better searchable than an organized database within a company (McAfee, 2006).

2.3.2.2 Links

Linking adds value to each piece of information by aggregating the relationship between contents and putting a dynamic add-on to each content page. Letting

the intranet network be linked and connected by the users themselves helps increase individual content quality (McAfee, 2006).

2.3.2.3 Authoring

Authoring allows content to be crowd-sourced and collectively edited and reviewed, leading to better quality results at lower costs (McAfee, 2006).

2.3.2.4 Tags

As previously referred (Grossman & McCarthy, 2007, Murugesan, 2007), collective categorization through a tagging mechanism allows organizing information with better results than a database organized by a constant team (McAfee, 2006).

2.3.2.5 Extensions

Enterprise 2.0 allows the content to be extended in an automated process powered by the tagging mechanism and user-generated linking, adding more quality in a scalable way (McAfee, 2006).

2.3.2.6 Signals

Signals are used to reduce information overload and, at the same time, provide contents based on the viewers' interests. This content distribution is called syndication, and RSS is a tool to achieve this purpose (McAfee, 2006, Murugesan, 2007)

According to McAfee (2006) the SLATES model is subject to network effects, where quality and application of knowledge are directly dependant on the overall usage of the platform, however Seo & Rietsema (2010) argue that the SLATES did not capture the social, emergent and freedom components. Later, McAfee added to his definition that Enterprise 2.0 is a collaborative process (Social) achieved by technology software in a connected digital environment (Platform) in an unstructured form, which is guided by user interaction to shape the utility of the technology (Emergent and Freeform) (McAfee, 2009).

Enterprise 2.0 rises from leveraging web 2.0 attributes and applying design-thinking-oriented-to-the-business processes. This application redesigned the tools referred in Web 2.0 to embrace these business processes and to fulfil the needs of the enterprise (Soriano et al, 2008).

2.3.3 Tools of Enterprise 2.0

Web 2.0 tools applied to the workplace, not only tackle different issues, as it needs to focus the technology on different obstacles. These issues are, as an example, information management, identity and network management and business process communication. As for the obstacles, these are mainly about privacy and sensitive information management (Koch, 2008). Considering these points, several authors described Web 2.0 tools from an Enterprise 2.0 perspective:

2.3.3.1 Enterprise Wiki

Enterprise wikis differ from consumer Wikis due to the restrictive size, the private platform and the focus on company-related topics and knowledge stored. Enterprise Wikis are used for knowledge, document and project management, ad-hoc collaboration, e-learning, CRM, software project documentation and technical support across the company (Jandos, 2009). The specific focus of knowledge generally organized by employees and clustered through the company on a similar structure as the company itself is one of the big differentiators of enterprise wikis (Soriano et al, 2008). According to Koch (2008), Enterprise wiki are fully information management tools.

2.3.3.2 Enterprise Blogging

Enterprise blogging can be separate by different audiences, each with a different set of knowledge to be transferred, as well as aesthetic and contents. Enterprise blogging, unlike consumer blogging, focuses on passing corporate information, written by employees or blogging partners related to the organization, targeting

either internal employees, external partners, suppliers or customers (Jandos 2009). The mashup of corporate blogs with enterprise wikis generate knowledge, social capital and allows harnessing collective intelligence (Soriano et al, 2008).

2.3.3.3 Enterprise RSS

Enterprise RSS differs from consumer RSS due to the channels of content distribution within the company (generally separated by departments), as well as the mashup between internal sources (other employees who are experts in a certain field) and external sources (content generated by public parties that are interesting for one's job). One of the main advantages is that accessing key information is easier and faster, which increases significantly the returns (for example, while talking to customers) (Soriano et al, 2008). Enterprise RSS also differs from consumer RSS due to the fact that internally the majority of content producers are knowledge workers, known for the expertise in certain areas. This makes the information more accurate and focused to each employees needs. (Jandos, 2009)

2.3.3.4 Enterprise Mashups

As per the definition of mashups, the capacity to mix different data sources and applications to create a new experience or new content provided offers the enterprise the possibility of unifying different tools of business processes for internal departments (Murugesan, 2007). The customization of solutions to adjust to the needs of employees and knowledge workers is the key differentiation between enterprise mashups and consumer mashups (Soriano et al, 2008).

2.3.3.5 Enterprise folksonomy and tag cloud

According to Soriano et al (2008), Enterprise folksonomy does not differentiate significantly from the consumer universe, but the tagging mechanics and the user-generated tag cloud tend to steer employees to the company's structure (for

example, the technology proposes specific tagging for Marketing contents or any other department). Enterprise folksonomy is still the key contributor to harness the collective intelligence of the organization's knowledge workers (Soriano et al, 2008).

2.3.3.6 Enterprise Social Networks

Enterprise Social Networks present the most significant difference in comparison to the consumer universe. Although design and mechanics are based on the same principles, the homogeneity of the channel across all users and the strong focus on communication tools stand out versus traditional social networks (Soriano et al, 2008). Another differentiation point is the emphasis on rivalry and analysis of the network users. These are features that are either less relevant or non-existent in consumer social networks (Soriano et al, 2008). The homogeneous channels are linked with the purpose of the network, where in a corporate environment focuses on exchanging information and knowledge directly connected with the company (Soriano et al, 2008). The focus on communication rises from the need of eliminating the silos and the obstructed communication between teams, customers, partners and suppliers (Gburzynski, 2011). Finally the rivalry and employee analysis comes from a management point of view and the unique capabilities offered by this technology to increase the outputs of the workforce (Soriano et al, 2008). According to Koch (2008), Social Networking (combined with social tagging) is in the centre of information management, identity network and communication, becoming the layer that unites all content among participants.

2.3.4 Employee adoption and corporate implementation of Enterprise 2.0

As it was previously referred (Jandos, 2009, Cisco Collaboration, 2010) Web 2.0 was penetrating in the workflow due to employee demand. Companies were either observing the adoption of Web 2.0 applications as a way to solve problems and increase productivity (a positive view), or a way for employees to solve

personal purposes, decreasing productivity (a negative view) (Jandos, 2010). Both scenarios led to different policies regarding the adoption of enterprise 2.0 within the company and according to Jandos (2010), company culture and profiles of employees tend to impact this technology adoption from management.

This cultural shift is mainly due to younger employees, who demand an internal voice in decision-making processes, and collaborative software such as Web 2.0 (and now Enterprise 2.0) tools enabled transparency and communication on corporate communication (Cook, 2008). Successful cases of Enterprise 2.0 deployment began at the bottom level, the end-users of the technology, which tend to be younger and tech-savvier (Bughin, 2008). According to a research from Bughin (2008), 45% of respondents said a grassroots movement[10] led the usage and implementation of Web 2.0 technology in the enterprise.

Corso et al (2008) argues that there are six dimensions that are generated by the adoption of Web 2.0 technology in companies, which fuels the reasons to implement Enterprise 2.0 tools: *Open belonging* – employees interacting with the social environment form groups and teams due to their necessity of integration -, *social networking* – participants of this technology interact because connections and relationships are means to a goal -, *knowledge networks* – workers require fast access to the exact knowledge -, emergent collaboration – employees rely on the tools because they need a fast collaboration environment to answer to a fast competitive growth from the market -, *adaptive transformation* – employees demand a real-time update on corporate information, policies and strategy – and *global mobility* – the volume of time spent away from the desk is compensated by the remote access to communication and information (Corso et al, 2008).

Although the Enterprise 2.0 adoption can rise from grassroots movements (Bughin, 2008), companies that do not prepare their infrastructure to adopt these tools will fail to absorb the potential and advantages of having a social

[10] Non-orchestrated movement, driven by the politics of a community, generally led by the bottom members of this same community. Source: http://en.wikipedia.org/wiki/Grassroots

environment (Soriano et al, 2008). IT departments are required to set processes that parse and activate on knowledge gathered through collaborative technology (Soriano et al, 2008). Research by Seo & Rietsema (2010) on the implementation of Web 2.0 tools by companies led to a division in quadrants, that crossed the conditions provided by IT departments, management and the organization itself with the actual technology adoption: companies in the second quadrant – also referred as *Technologically Lacking Enterprise 2.0* – demonstrated all the conditions and infrastructure to have Enterprise 2.0 but employees did not adopt Web 2.0 in their workflow. On the other hand, companies in the fourth quadrant – referred as *Mislead Enterprise* – adopted Web 2.0 without having the internal conditions to absorb the value. These conditions are not only linked to the IT existing in the company, but also the technology used by employees to perform their work; Mobile work is an example (Seo & Rietsema, 2010).

2.3.5 The Mobility of Enterprise 2.0

Mobility in companies, from a technology usage point of view, is both a cause and an effect of both the software used by employees, as the hardware that runs this technology (Basole, 2007). Companies are developing a Mobile DNA (Devices, Network and Applications), first because devices are being developed considering how employees can use in their workplace, second because networks are finally becoming robust and capable of delivering the required speed and data, and finally because software is being created and designed with a focus on the enterprise (Basole, 2007). This scenario can be the cause for new mobility profiles to emerge (Basole, 2007) or can be the effect from these profiles emerging.

According to Corso et al (2008), the ICT-enabled services (information and communication technology), allow companies to overcome geographical, time and organizational obstacles, and Enterprise 2.0 comprises the tools to achieve this goal. Sørensen et al (2008) also argues that mobile enterprise allows overcoming challenges such as remote accessibility and control of information.

Mobile enterprise allows employees and managers to mediate their remote control of information and maintain the control over all information through discrete actions that can influence decision-making moments (Sørensen et al, 2008, Sørensen, 2011). This affirmation coincides with some of the advantages of having a mobile strategy: *access* - development of corporate network and accessibility in mobility -, *cost savings* - Expensive computing is replaced by mobile less expensive solutions -, *accuracy* – there is a general reduction of errors due to technology improvement-, *productivity* – mobile software enables a higher quality response -, *responsiveness* – this same response is faster-, *effectiveness* – the ability to tackle time-critical and location-required tasks in a better way -, *efficiency* - access to information in a mobile environment at a lower cost, both for company and for the employee-, *convenience* – the capacity to communicate in real-time, regardless of geography, with all parties required in the decision making process (Basole, 2005).

2.3.6 Advantages and risks of Enterprise 2.0

Besides the advantages from Web 2.0 usage previously referred (Murugesan, 2007, Grossman and McCarthy, 2007), and the advantages of a mobile implementation in the workplace (Basole, 2005) some authors state benefits, which are exclusive to the enterprise environment, upon implementing Enterprise 2.0 tools. The advantages according Bughin (2008), Grossman & McCarthy (2007) and Soriano et al (2008) can be found in Section 1 - Table 2.

2.4 Enterprise Social Networks

This sub-section covers the definitions, origins and features of enterprise social networks, one of the key tools from enterprise 2.0 technologies. This chapter also covers the adoption of this technology by employees and the advantages of enterprise social networks.

2.4.1 Definitions and Origins of Enterprise Social Networks

Existing intranet services do not solve the challenges regarding people relationship management and real time communication, including knowledge management (Di Micco et al 2009). Since traditional intranet services use a top-down approach, it is ineffective with information sharing (Cook, 2008), and the main reason is because this technology was built while communication was still done in closed silos (Gburzynski, 2011). According to Corso et al (2008) enterprise 2.0 and enterprise social networks "allow for the first time to integrate in an unified approach both the intranet, the ERP and CRM technologies, adding real-time and collaboration-designed capabilities."

Preceded by a collection of Web 2.0 technologies like wikis, blogs, micro-blogs, RSS feeds, and tagging, social software has evolved to enable people to share knowledge, contribute opinions, and participate in virtual communities of interest, in a dimension not offered by current intranet solutions (Cisco Collaboration, 2010). An enterprise social network is the connector of all participants within an enterprise software platform (Fauscette, 2012).

Label collaboration was a first stage of Enterprise 2.0. Social networking integration is the second and more dynamic stage of Enterprise 2.0. This last stage is the merger between the utility of collaboration tools and knowledge access, with the fun of networking (Byrne, 2008). This collaboration environment happens because enterprise social networks are about bringing sociological aspects present in consumer social networks to the business universe, without compromising security, intellectual protection and privacy, and separating these fields enough to offer an open environment for communication fostering innovation and knowledge exchange (Byrne, 2008).

Enterprise Social Networks have as one of the objectives to overcome people-related challenges, such as maintaining workers updated, reducing distance between teams and employees, fostering relationships, providing real time communication and information and matching knowledge between those with

the skills and those demanding them (Di Micco et al 2009), and to do this, current social software tools integrate a number of applications to achieve several such needs such as blogs, wikis, social rankings, project tracking and participation, multimedia storage, information filtering, file sharing, discussion boards, instant messaging, people databases, web conferencing, among others (Byrne, 2008).

The value of enterprise collaboration powered by social software lies on the premise that information, which is easily found and knowledge adjusted to real time needs that changes dynamically, will be significantly beneficial in several areas of a company, especially when employees rely on technology to achieve competitive advantage in their industry (Soriano et al, 2008).

2.4.2 Usage and adoption of enterprise social networks in the workplace

According to Sitaram, over the next few years there will be a big transformation in the workplace as large numbers of Gen X and Y individuals start entering the workforce. These are individuals who work in social empowered environments and communicate through social networks (Sitaram, 2010). New workers have always interacted with their own devices from a young age, achieving proficiency with real-time communication via messages, cameras and video chatting and sharing dynamic files such as videos and audio. This communication method was answered by the creation of new tools integrated in enterprise social network as well as enterprise 2.0 (Gilchrist, 2007).

2.4.3 Enterprise Social Network Components

The components of enterprise social networks derive from the principles of Web 2.0 (O'Reilly, 2005) the features of Web 2.0 (Bughin, 2008, Gilchrist, 2007, Murugesan, 2007), the SLATES (McAfee, 2006) and the components of Enterprise 2.0 (Koch, 2008, Jandos, 2009, Soriano et al, 2008). All these dimensions allowed authors to divide the enterprise social network offer in

components (Fauscette, 2012), capabilities (Cisco Collaboration, 2010) and services that serve the user of this tool (Büchner et al, 2011).

2.4.3.1 Features of enterprise social networks

According to Fauscette (2012), the main components that allow a social network to have full potential are detailed in Table 3.

Activity stream in a unified experience for communication
Detailed profiles of users, focusing on required information
Mobile design focusing on the platform usage
Blogs
Wikis
File sharing capabilities
Intelligent information filtering and labelling
Task management tools
Decision insight provider (using tools to analyze data)
Integration, both with enterprise 2.0 software or traditional enterprise software
Ability to extend the network through 3rd party development within enterprise software
All other enterprise 2.0 tools unified under the social network

Table 3 – Components of Enterprise Social Networks

Jandos (2010) added that the new needs in the younger and tech-savvier generation demanded more dynamic solutions, which led to the incorporation of microblogging – an "Application or service that uses a short format to broadcast information in large scale, using the methodology of syndication to get content delivered to those interested" – podcasting – a method of digital video and in order to broadcast under a syndication method – and video-sharing – which are applications allowing sharing of media contents in the network.

2.4.3.2 Services of enterprise social networks

Finally, according to research by Büchner et al (2011), enterprise social networks can be divided in 13 general service categories that serve users of this technology. Since social networking works as the layer that connects all the individual nodes with the features of social software (Soriano et al, 2008) these categories can also be linked both to the enterprise 2.0 and enterprise social network tools as well as respective capabilities. These categories can be divided in user-centric, content-centric or orthogonal (Büchner et al, 2011), depending on their focus:

- *Content-centric services* – Content-centric services are those who serve and focus on the content existing in the network and how users can transform this content: authoring, link management, tagging, search, version management, and desktop file integration (Büchner et al, 2011).

- *User-centric services* –User-centric services are those who serve and focus on the user and his capabilities of interacting with the network and the technology: access control, feedback, social networking, awareness, and usage analytics (Büchner et al, 2011).

- *Orthogonal services*: - Orthogonal services are those linked between user and content centric, and shared by all tools: consistent graphical user interface and personalization (Büchner et al, 2011).

2.4.4 Advantages of enterprise social networks

Beyond all the advantages brought to users and employees by web 2.0 applications (Murugesan 2007, Grossman and McCarthy, 2007) and enterprise 2.0 tools (Bughin, 2008), according to several authors (Cook, 2008, Byrne, 2008, van Zyl, 2009, Sitaram, 2010, Fauscette, 2012, Wood, 2013) enterprise social networks offer a set of benefits that, by itself demonstrates the value of implementing this technology in the enterprise. *Section 1 - Table 4* resumes the advantages of enterprise social networks for companies.

2.5 Dishaw and Strong's integrated model

This chapter focuses on a theory from Mark Dishaw and Diane Strong (Dishaw & Strong, 1999) that there are two models that serve as theoretical basis for the implementation of a new technology in a company and how this technology impacts the performance of its users. The first is the Technology Acceptance Model (Davis, 1985), which focuses on studying the behaviour and variables affecting the attitudes regarding the use of IT; and the second is the task-technology fit (Goodhue & Thompson, 1995) which focuses in matching the capabilities of the technology with what the tasks demand. But Dishaw and Strong (1999) argue that both models overlap in some perspectives and that a model combining both theories will offer a more explanatory power.

2.5.1 Introduction to the original models

In this sub-section its detailed Dishaw and Strong's model (1999) based on Davis' Technology Acceptance Model (1995) and Goodhue & Thompson's Task Technology Fit model (1995).

2.5.1.1 Technology Acceptance Model

The technology acceptance model (Davis, 1985) was developed as an adaptation between the theory of reasoned action (Sheppard et al, 1988) and the theory of planned behaviour (Ajzen, 1991), but adjusted to the information technology.

The technology acceptance model studies the variables that determine or influence the attitude regarding the technology use, being these the perceived ease of use and the perceived usefulness. These variables allow dividing the intention of use of the IT and the actual use of the technology (Davis, 1985).

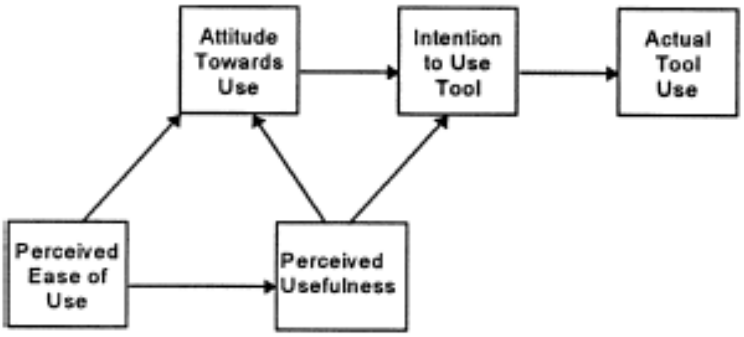

Figure 1 – Connection of constructs according to Davis (1985)

Deconstructing the variables of the model (Davis, 1985): people use or not a technology depending on their assessment on how it affects their job. This is perceived usefulness. According to Davis' description (1985) perceived usefulness is "the degree to which a person believes that using a particular system would enhance his or her job performance". According to Davis (1985) people also tend to find a technology useful if the effort on learning and using this technology is lower than the perceived benefits. This is the second variable: perceived ease of use. According to Davis (1985) perceived ease of use is "the degree to which a person believes that using a particular system would be free of effort". Figure 1 resumes the connection between all variables in the model.

Based on Dishaw and Strong's theory (1999) one of the weaknesses of the technology acceptance model is that it lacks attention to the tasks and end-use of the technology. A better-defined inclusion of the tasks characteristics can, not only provide a better model of technology usage, but also study the latter stage of the technology implementation: the actual use of it (Dishaw and Strong, 1999).

2.5.1.2 Task technology fit model and constructs

The task technology fit is a construct that derived from the ability of an information technology to support a task by matching the IT capabilities to the demands from the task (Goodhue & Thompson, 1995).

The task technology fit theory states that a specific technology will be used if its functions support the activities of the user. Experienced users will select the

methods that enable them to perform the task with the greatest benefit and the least effort (net benefit) (Goodhue & Thompson, 1995).

According to Goodhue & Thompson (1995), it is possible to deconstruct the theory by its variables: technologies – the tools used by individuals to perform tasks and to assist the reduction of effort in accomplishing actions -, tasks – which are actions performed by individuals that vary in terms of complexity, interaction and resources needed – and individuals – people who use the technology to perform the tasks.

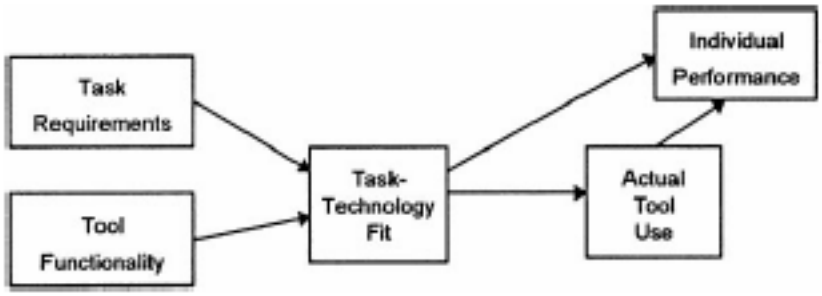

Figure 2 – Connection of constructs according to Goodhue & Thompson (1995)

Individuals, requiring performing an action, define task requirements. The tool functionality if defined by the capabilities existing in each technology. The task-technology fit is defined by the combination of both dimensions and can vary in power of fit. The impact in each employee's performance is dependent not only in the power of the fit, but also in the actual use of the technology (which is not explained by this model). Figure 2 resumes the connections between all variables of the model.

According to Dishaw and Strong (1999), the weakness in the task technology fit lied in the fact that it doesn't include the attitudes and intention regarding the use of a technology, dimensions covered by the technology acceptance model. Dishaw and Strong propose a combined model with a stronger explanatory power, tackling both the early stage of technology implementation and the later stage of implementation (Dishaw & Strong, 1999).

2.5.2 Dishaw and Strong's Integrated Model

According to Dishaw and Strong (1999), the argument for model integration lies in the capture of two aspects regarding the use of technology by individuals, something each model alone doesn't do.

Dishaw and Strong argue that the task technology fit model can determine three variables in the technology acceptance model: affect utilization, as well as the two TAM attitude determinants, perceived ease of use and perceived usefulness (Dishaw & Strong, 1999). According to the authors "user beliefs about usefulness and ease of use are likely to be developed, in part, from rational assessments of the characteristics of the IT and the tasks for which it could be used". In light of these statements, a new model was designed to accommodate both theories and provide more explanatory power (see figure 3).

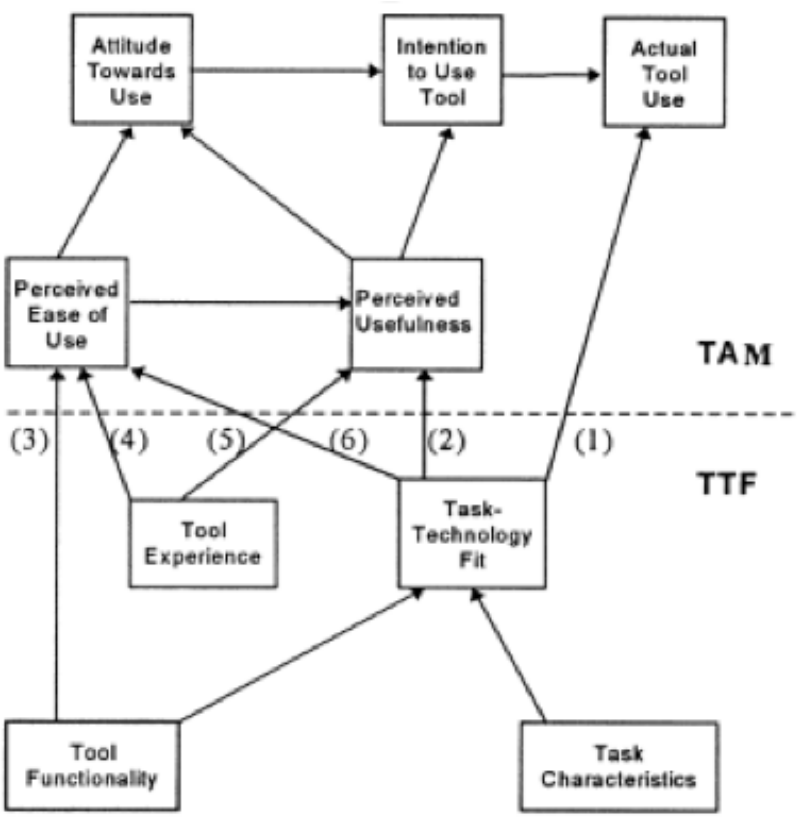

Figure 3 – Connection of constructs according to Dishaw and Strong (1999)

Dishaw and Strong (1999) defend that the integrated model directly impacts on user knowledge (and as a consequence on job performance), since this knowledge derives from the assessment of the task characteristics and tool

functionality, and from the assessment of the technology regarding the ease and usefulness for personal benefit.

According to Dishaw and Strong's model the majority of paths correlate positively, but three paths have an inverse relationship. The more complex are the tool functionalities, the harder is to perceive the ease of use of a technology. The complexity of task characteristics also reduces the probability of the technology to be fit. Finally, although not explicit in the model, there was a significant (negative) relationship between the task characteristics and the actual use of a technology.

2.6 Chapter conclusion

This chapter presented the evolution of web 2.0 until its penetration in companies through enterprise 2.0 technologies. The chapter details the components of each evolution of the tool, including the advantages and the purpose of its features. Regarding enterprise 2.0 technologies, the corporate implementation as well as specific features such as mobility, advantages and its risks for companies are also explained. Finalizing the tool's evolutions, the constituents of enterprise social networks and the adaptation to business context, including the services provided by the technology and its advantages for employees, managers and companies are demonstrated.

In the end of the chapter is also explained Dishaw and Strong's theory, the base for the model proposed in the next chapter.

III. Proposed Model

3.1 Chapter introduction

This chapter covers a model proposed to answer the research questions, based on the literature of enterprise social networking and theories around technology implementation in companies and fit of technology towards tasks. This chapter explains the method to build the model, originating the hypotheses that demonstrate the drivers and influencers of the integration of social enterprise networking technology in different sectors of Portuguese companies.

3.2 Building the proposed Model

As stated in the introduction, this dissertation aims to answer three main research questions regarding the existence, implementation and usage of enterprise social networks in various Portuguese sectors:

1. Are current Portuguese companies using any enterprise social networks to connect employees internally?

2. Are employees aware of this technology, its advantages and do they believe it fits their jobs?

3. Is management aware of the advantages of this technology and is it willing to implement enterprise social networks within their companies?

Considering the research questions, this dissertation focuses on building a model that considers the implementation of new technologies in the workplace and the knowledge of these technologies to satisfy objectives. Adding to the implementation of new technology, the model looks to integrate theories around the adjustment of technology to the needs of the workplace.

Considering the objectives stated above, the selected theory that matches the needs of the model is the integrated theory of Dishaw and Strong (1999), which uses the technology acceptance model (Davis, 1985) extended with constructs from a task technology fit model (Goodhue & Thompson, 1995). **Dishaw and Strong's model (1999), which links the implementation of new technology in the workplace and its acceptance from users, and at what extent it fits the work requirements of these users, perfectly addresses the aim of this study, regarding understanding how enterprise social networks can be implemented in Portuguese companies, what is the acceptance of these tools by Portuguese employees and managers, and how this technology fits their tasks and jobs.**

This dissertation aims to select a leading enterprise social network currently being deployed in the market, whose information can be easily collected with high qualitative descriptions to be presented to survey respondents, in order to offer an experience of accessing the tool. Therefore, for the research methodology and hypotheses validation this dissertation uses Yammer's functionalities and the enterprise social networks advantages, one of the leading social network vendors for companies[11], whose detailed information on how it works provides a presentable ad-hoc experience for respondents[12].

3.2.1 Dishaw and Strong Integrated theory

According to the theories covered in the literature (Davis, 1985, Goodhue & Thompson, 1995, Dishaw & Strong, 1999) this dissertation proposes a model to study the drivers and influencers of implementing enterprise social networks in Portuguese companies by linking the integrated TAM/TTF with variables based on the authors' own validated model (Dishaw & Strong, 1999).

This work studies how fit is Yammer depending on: the task characteristics of Portuguese employees in the different sectors, the tool functionalities of Yammer and the experience of these employees with similar technologies. This model also

[11] http://mashable.com/2012/08/15/business-social-enterprise-technologies/
[12] https://www.yammer.com/product/feature-list/

takes in consideration the perceived ease of using the technology, which consequently affects how useful it is perceived to fulfil the demands of work tasks (Davis, 1985). The fit of the technology to the task also affects both the ease of use and the utility (Goodhue & Thompson, 1995), resulting in the potential use of the IT in the workplace (Goodhue & Thompson, 1995) as highlighted in Figure 4.

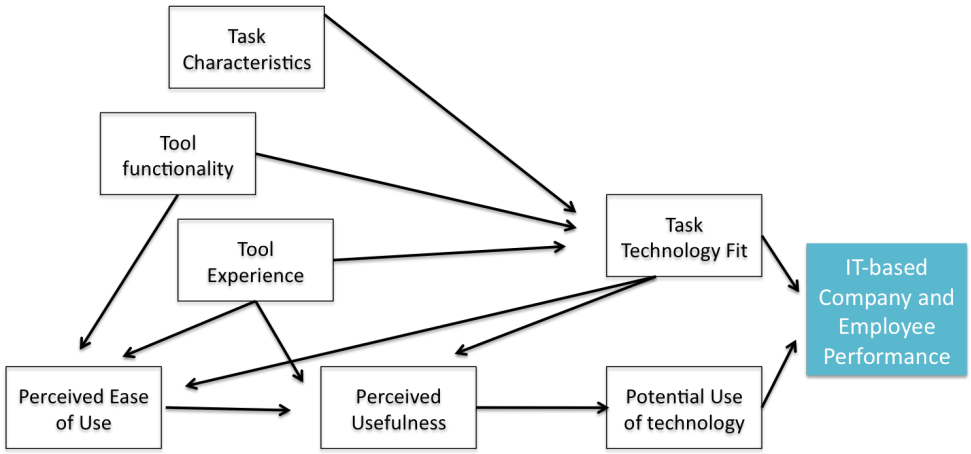

Figure 4 – Connection of the Dishaw & Strong's constructs with company and employee performance

3.3 Proposed hypotheses

Considering the model and theories explained both in the state of the art and the beginning of this chapter, there are hypotheses required to hold in order to answer the research questions. Further explanation is offered for the reasoning of each hypothesis.

> *H1: Tasks from Portuguese employees are adjusted to the functionalities provided by enterprise social networks*

According to Dishaw and Strong (1999), the relationship between enterprise social network functionalities and the task characteristics is a key point to determine how fit this technology can be in the workplace. This first assessment allows determining the task-technology fitness. The variables that impact this result, as stated in the literature are: tool-functionality awareness, experience with the technology (or similar products) and the characteristics of the task

where the technology would be implemented (Goodhue & Thompson, 1995, Dishaw & Strong, 1999).

> *H2: Employees in Portuguese companies acknowledge the advantages and the functionalities of enterprise social networks and would use them if available in the workplace.*

Considering the proposed model, both the integrated theory of Dishaw and Strong (1999) and the functionalities and advantages of Yammer studied in the state of the art are used. As stated in the literature, the perceived ease of use is directly related to the perception of the tool functionalities and the relationship of these with their task demands. The perceived usefulness is based on the ease of using this technology and the experience, either with the respective IT or similar tools. Perceiving positively these variables leads to an acknowledgement of the advantages of the technology and its functionalities (Davis 1985, Dishaw & Strong, 1999).

> *H3: Managers at Portuguese companies are aware of the value of having enterprise social networks in the workplace and have plans to implement it in the future.*

The last hypothesis is based both on the task technology fit segment and the technology acceptance segment of Dishaw and Strong's model (1999). According to the authors, for enterprise social technology to be successfully accepted, implemented and rightfully used, managers are required to understand the value and functionalities of enterprise social networks when applied to a corporate environment (Dishaw & Strong, 1999).

3.4 Methodology Structure

Considering the literature reviewed, the proposed model and the hypotheses posed, it is possible to divide the hypothesis validation in 3 dimensions. These dimensions link the questions of the survey with the theoretical constructs, which will serve as intermediary drivers for validation and to answer the research questions in this dissertation. This sub-chapter demonstrates the

connections between the constructs provided by Davis (1985), Goodhue & Thompson (1995) and Dishaw and Strong (1999).

3.4.1 Variables

In this sub-chapter are presented the dependant variables used for the statistical analysis (and key drivers to validate the proposed hypothesis), the independent variables and control variables.

3.4.1.1 Dependent variables

The independent variables used in the study are:

Perceived task fitness – this variable indicates how adequate an employee perceives a technology, in this case enterprise social technology Yammer, to fit the requirements of its tasks.

Intention to use a technology – this variable indicates how likely is an employee to use a tool or a technology, assuming that it is available in the workplace, or its intention to express desire to use it in case it is not available in the workplace.

Intention to implement the technology – this variable, which varies from the intention to use the technology, indicates what is the probability of an employee with managerial duties to implement or propose implementation of the technology in the workplace.

3.4.1.2 Independent variables

The independent variables considered for the analysis are:

Utilization of data, tools and expertise in the workplace – variable tested by question 3 that states the volume of utilization of information, knowledge and technology software on a daily basis.

Contact with co-workers – variable tested by question 4 that indicates the volume of contact with co-workers to fulfil daily tasks.

Contact with external partners – variable tested by question 5 that indicates the volume of contact with suppliers, partners and clients on a daily basis.

Task technology fitness – variable tested by question 6 that indicates how adequate employees find their tasks to be related to the technology features.

Experience with social networks – variable tested by question 8 that states what is the level of fluency with social network tools outside the workplace.

Easiness of learning Yammer – variable tested by question 10 that indicates the perceived easiness of learning Yammer based on the demonstrated information.

Likelihood of using the technology in the workplace – variable tested by question 12 that indicates how likely would be for employees to use the tools if available.

Importance of promotion of the technology by management – variable tested by question 13 that indicates the perceived importance of having the management in the company supporting the usage of the technology.

Utility in a manager's perspective – variable tested by question 15 that indicates the perceived utility of using the technology for managerial tasks.

Impact of employee's desire for access to the technology – variable tested by question 18 that shows the impact on manager's implementation intention after knowing there is demand from their employees regarding accessing the technology.

3.4.1.3 Control variables

The control variables considered for the analysis are:

Age – age of respondents is one of the control variables and is tested by question 1 (<21 years old = 1, 22-29 years old = 2, 30-44 years old = 3, 45-54 years old = 4, 55-64 years old = 5, >65 years old =6).

Gender – control variable tested by question 2 (Male = 1, Female = 2)

Existence of enterprise social network in the workplace – control variable tested by question 7 (Yes = 1, No = 2, Not sure = 3).

3.4.2 Sub Dimensions

The sub-section analyses the link between the hypotheses posed by the model with the questions that aim to validate them, and how the constructs and respective model dimensions support these questions.

3.4.2.1 Employee-Task-Fitness Assessment

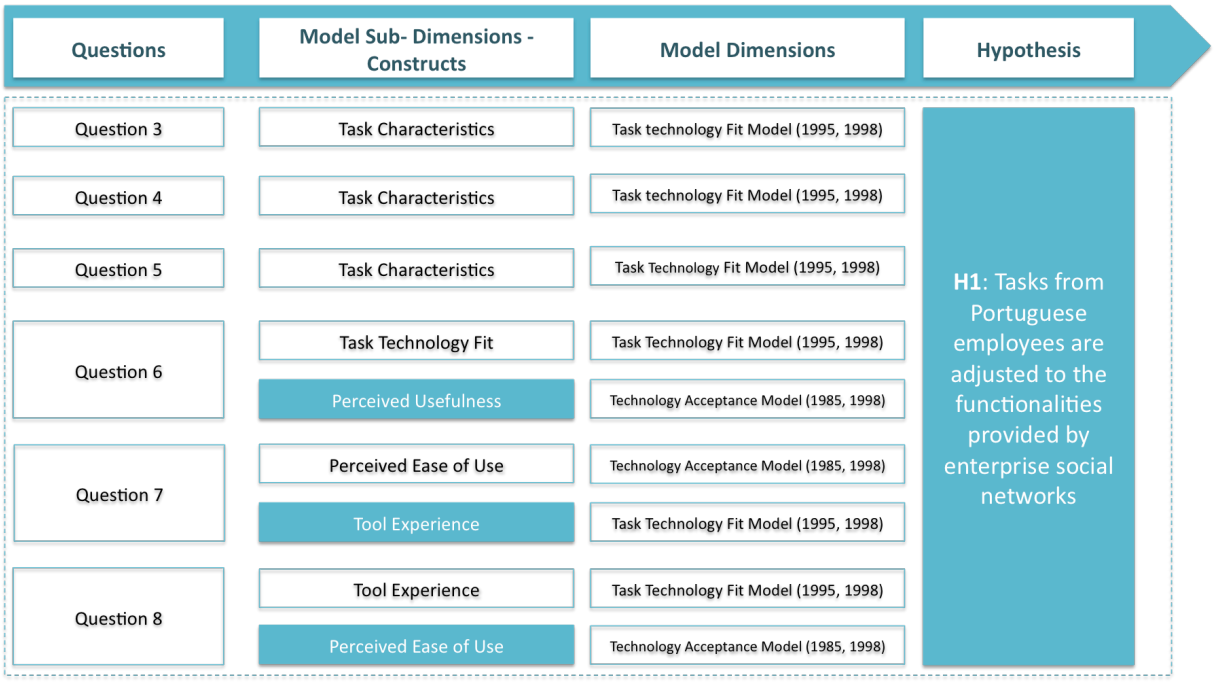

Figure 5 – H1 connection with model dimensions, sub-dimensions and survey questions
Model sub-dimensions highlighted are indirect relationship constructs with the respective question

In order to validate the first hypothesis, the survey questions are based on the constructs validated by Strong and Dishaw (1999) and adapted to suit the

specific technology and the market where the study is being conducted. Each question is assigned to the specific constructs, which are divided between the base theories (Davis' technology acceptance model (1985) and Goodhue's task technology fit (1995)). Some constructs (highlighted in the model sub-dimensions (see figure 5)) demonstrate an indirect relationship with this question and the relationship of the respondent when answering (Dishaw & Strong, 1999)

According to the authors, the base to propose these connections and questions is that demonstrating that task requirements with a significant level of communication with business stakeholders on a daily basis, a strong experience with similar tools and a perceived fitness and utility from the technology is enough to validate the first hypothesis.

Next is an explanation between each individual question and the connection to the respective sub-dimension constructs and the theory from Dishaw and Strong (1999):

> *Q 3 - How would you rate the volume of information (data), technology (tools) and access to expertise (knowledge) you require to perform your tasks?*

The Task Technology Fit model (Goodhue & Thompson, 1995) argues that information usage, technology usage and knowledge usage improves the fit and probability of a technology being accepted and successfully implemented in the workplace. This assumption is backed by the maintenance task activity items in Dishaw & Strong's model (1999). The respective construct, according to the authors, is task characteristics.

> *Q 4 - How often do you need to communicate with your co-workers on a daily basis in order to perform your tasks?*

> *Q 5 - How often do you communicate with external parties (suppliers, customers, partners) on a daily basis in order to perform your tasks?*

The Task Technology Fit model (Goodhue & Thompson, 1995) argues that users with tasks that require internal or external communication and exchange of contents and information, enables a technology to be accepted and successfully implemented in the workplace. According to Dishaw and Strong (1999), the validated survey items are maintenance task activity items and the respective construct is task characteristics.

> *Q 6 - Taking into account the previous description of the technology Yammer and its functionalities, how would you rate the fit between the technology and the tasks you need to perform at work?*

The task technology fit model (Goodhue & Thompson, 1995) connects the perceived fitness (the direct construct from this question) with the perceived usefulness of the technology acceptance model (Davis, 1985). According to Dishaw and Strong's own model, users must perceive a technology useful to understand the fit to their tasks. Therefore, for question 6, the direct sub-dimension construct is technology fitness, with an indirect connection with perceived usefulness.

> *Q 7 - Are you currently using any social networking technology in your workplace?*

According to Dishaw and Strong (1999), users stating to use a social technology at work will have a different perceived ease of using this specific technology compared to users who never faced this scenario, mainly due to tool experience. Question 7 is therefore linked with the authors construct "perceived ease of use" and an indirect relationship with "tool experience".

> *Q 8 - How would you rate your experience with social networking technology outside the workplace?*

With a similar explanation to last question, question 8 focuses on understanding what is the active experience of each respondent with social tools, whether for companies or consumer usage. According to Dishaw and Strong (1999), this question is directly linked with the tool experience construct with an indirect relationship to the perceived ease of using the technology.

3.4.2.2 Employee Functionality-Fitness Assessment

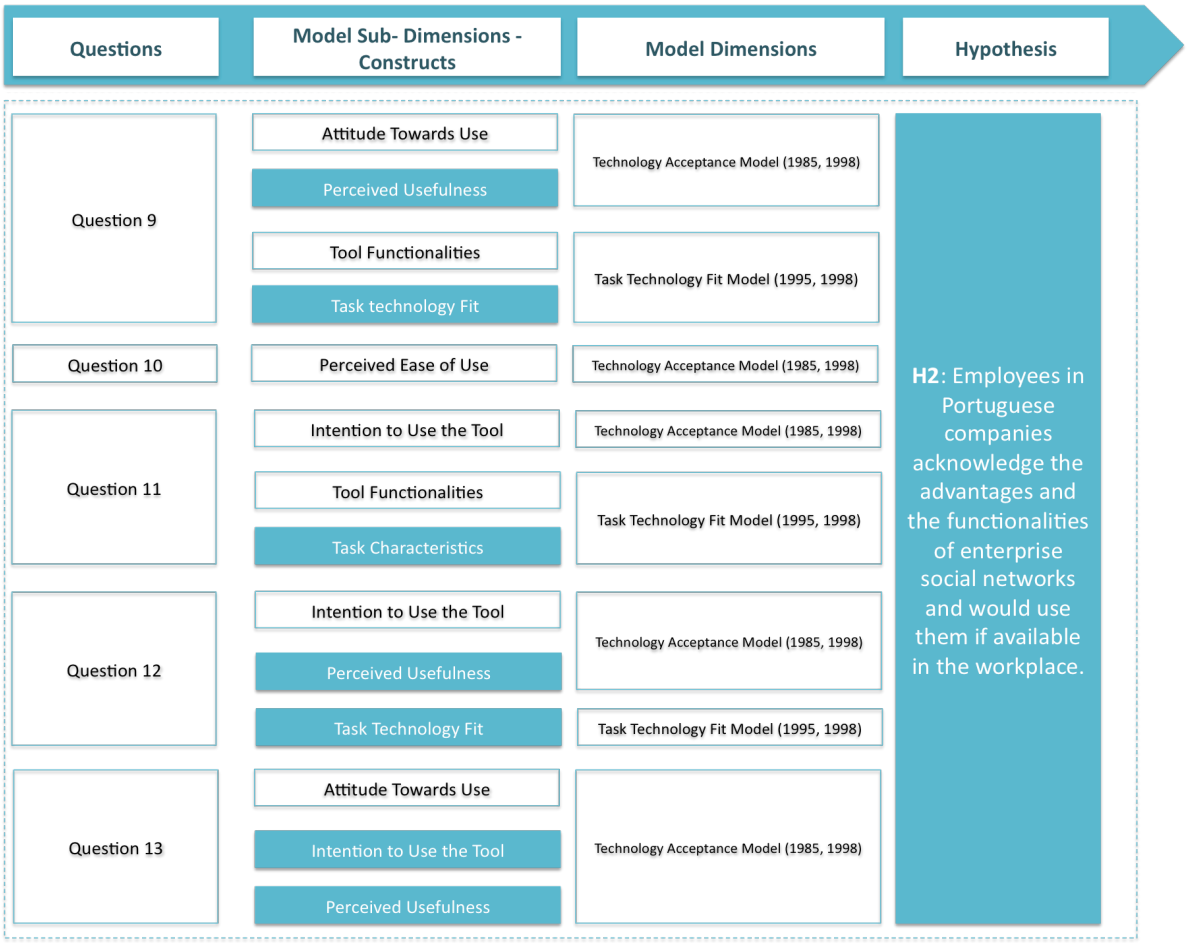

Figure 6 – H2 connection with model dimensions, sub-dimensions and survey questions
Model sub-dimensions highlighted are indirect relationship constructs with the respective question

In order to validate the second hypothesis, the survey questions now focus on understanding perceived utility based on features, advantages and the task requirements of users (Goodhue & Thompson, 1995). In order to evaluate the potential of using the tool (i.e. intention of utilization), the technology acceptance model (Davis, 1985) offers the constructs that grant the capacity to validate the hypothesis. The following questions were built around Dishaw and Strong's validated survey (1999), but adapted to the technology and market where the survey was conducted:

Q9 - Considering your task requirements, please select, in your opinion, the top four advantages of enterprise social networks? Please rate assuming which advantages would be more important to impact your performance

According to Dishaw and Strong's model (1999), question 9 is directly linked with the construct "Attitude toward tool use" based on the technology acceptance model (Davis, 1985) and the construct "tool functionality" from the task technology fit model (Goodhue & Thompson, 1995). The first construct, according to the author, is also indirectly connected with perceived usefulness, since a user in order to generate an attitude is required to perceive utility from the tool (either positive or negative). The second construct, supported by the maintenance tool function items in Dishaw and Strong's survey (1999) also leads to perceived technology fitness (again, either positive or negative).

Q 10 - Considering your experience with social networks, how easy do you believe it would be to learn and use Yammer at work?

Question 10 was built around Dishaw and Strong construct "perceived ease of use", to analyze the perceived learning curve to master the tool. The technology acceptance model argues that, among variables that facilitate tool acceptance, one is perceived easiness of using the technology on daily tasks (1985)

Q11 - Considering the description of the technology Yammer and its functionalities, for which tasks do you believe you would use Yammer? If any of the tasks described below are not part of your day-to-day job requirements, please select based on your probable reaction.

According to Goodhue & Thompson (1995) and later with Dishaw and Strong (1999), the task technology fit model argues that demonstrating an employee would likely use a tool, feature or technology to perform a task is a first sign of intention to use the tool, if available. This leads to the connection with the construct "intention to use the tool" (Dishaw & Strong, 1999). At the same time, the theory says that acknowledging the fit of a technology towards a task demonstrates that the user recognizes the tool functions and its objectives. This connects question 11 to the second construct "tool functionality", validated in

Dishaw and Strong's model by the maintenance task activity items (Dishaw and Strong, 1999). Finally, based on Goodhue's theory (1995), there is a relationship between these two areas and the task characteristics of employees. This leads to an indirect, but existent, connection with the task characteristic construct.

> *Q 12 - Considering all the information previously described, how likely would it be for you to use Yammer to help you perform your tasks?*

Question 12 was built based on the construct of intention to use the tool to perform tasks (Davis, 1985). According to the authors Dishaw and Strong (1999), considering all the advantages connects the intention to use with perceived usefulness to improve task achievement. Perceived technology fitness to the employee's tasks is also indirectly connected offering the last construct for this question (Dishaw & Strong, 1999).

Question is directly linked with intention to use the tools, considering all the features and advantages that the technology brings to task performance.

> *Q 13 - How relevant would be for top management to promote the usage of this technology, for you to adopt in your day-to-day activities?*

The technology acceptance model (Davis, 1985) argues that certain variables could potentially affect the probability of implementing and using a technology. To build question 13, this premise was considered in order to analyze the variable "management impact" towards the attitude of employees viewing these tools as useful. The construct "attitude towards the use" is the direct sub-dimension (Dishaw & Strong, 1999), and intention to use the tool and perceived usefulness are indirect constructs that are connected with the first, since both attitude and perceived usefulness tends to impact intention to use (Davis, 1985).

3.4.2.3 Management Functionality-Value Assessment

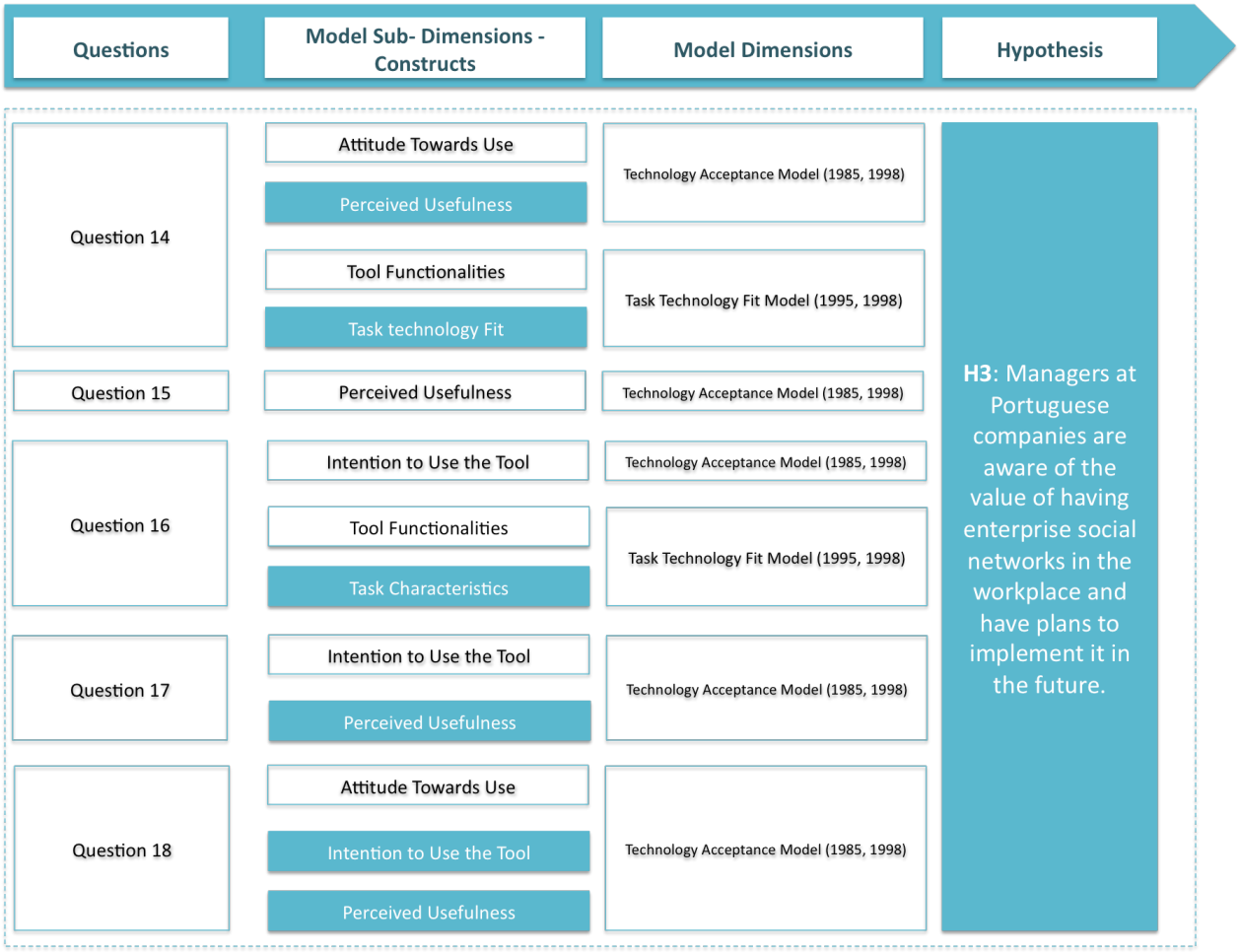

Figure 7 – H3 connection with model dimensions, sub-dimensions and survey questions
Model sub-dimensions highlighted are indirect relationship constructs with the respective question

This next set of questions is aimed at employees who also have a managerial position. According to Seo and Rietsema (2010), one of the success dimensions for implementation of enterprise social networking technology is related with management and IT department, and their actions towards creating the environment and fostering the use of the technology by collaborators.

In order to validate the third hypothesis, the survey questions replicate the approach of hypothesis 2, but now directing respondents to analyze the tool utilization and potential advantages from a managing perspective. According to Dishaw and Strong (1999), demonstrating that managers find this technology useful, significantly relevant towards performing their tasks and would likely implement given the advantages validates the last hypothesis.

Q 14 - Considering your managerial task requirements, please select, in your opinion, the top four advantages of social networks in the workplace? Please rate assuming which advantages would be more important to impact your performance.

Question 14, which was built the same way as question 9, is directly linked with the construct "Attitude toward tool use" based on the technology acceptance model (Davis, 1985) and the construct "tool functionality" from the task technology fit model (Goodhue & Thompson, 1995), supported by Dishaw and Strong's maintenance task activity items (1999). The indirect relationship, as explained previously (see question 9), are the perceived usefulness connection with the attitude towards using this same tool (Davis, 1985), and the perceived fitness, consequence from understanding tool functionality (Goodhue & Thompson, 1995).

Q 15 - Considering the description of Yammer's features, the advantages of enterprise social networks and taking into account your managerial tasks, how would you evaluate the usefulness of having this technology available to manage your employees?

Question 15 has the objective of understanding the respondent's perception of utility regarding all the information, advantages and features provided through the survey. This question is linked with the construct "Perceived usefulness" in Davis' model (1985) and supported by Dishaw and Strong (1999).

Q 16 - Considering the description of the technology Yammer and its functionalities, for which tasks do you believe you would use Yammer? ? If any of the tasks described below are not part of your day-to-day job requirements, please select based on your probable reaction.

Question 16 is a replication of question 11, but considering the management point of view. "Intention to use the tool" (Davis, 1985) and "task characteristics" (Goodhue & Thompson, 1995) are the constructs, which are validated by Dishaw and Strong's model with the task maintenance activity items (1999)

Q 17 - Considering the described functionalities and advantages of enterprise social networks, how likely would it be for you to implement or propose the implementation of this technology in your workplace to management or the IT department?

The technology acceptance model (Davis, 1985) argues that there is a connection between users perceiving a technology useful and understanding the fit to their tasks. In this case, targeted at managers, question 17 focuses on analyzing the intention of implementation in the workplace.

Q 18 - How likely would it be for you to implement this technology if employees demanded or asked for networking technology to exist in the office?

Question 18, which was built the same way as question 13, focuses on understanding if demand from employees can be a variable that impacts decision making regarding implementing or proposing the implementation of the technology in the manager's company. The constructs that guide this question are the attitude towards the tool (influenced by the demand of employees) and, indirectly, the managers own intention to use the tool and his perceived usefulness to perform tasks (Davis, 1985, Dishaw and Strong, 1999).

3.4.3 Theoretical path structure

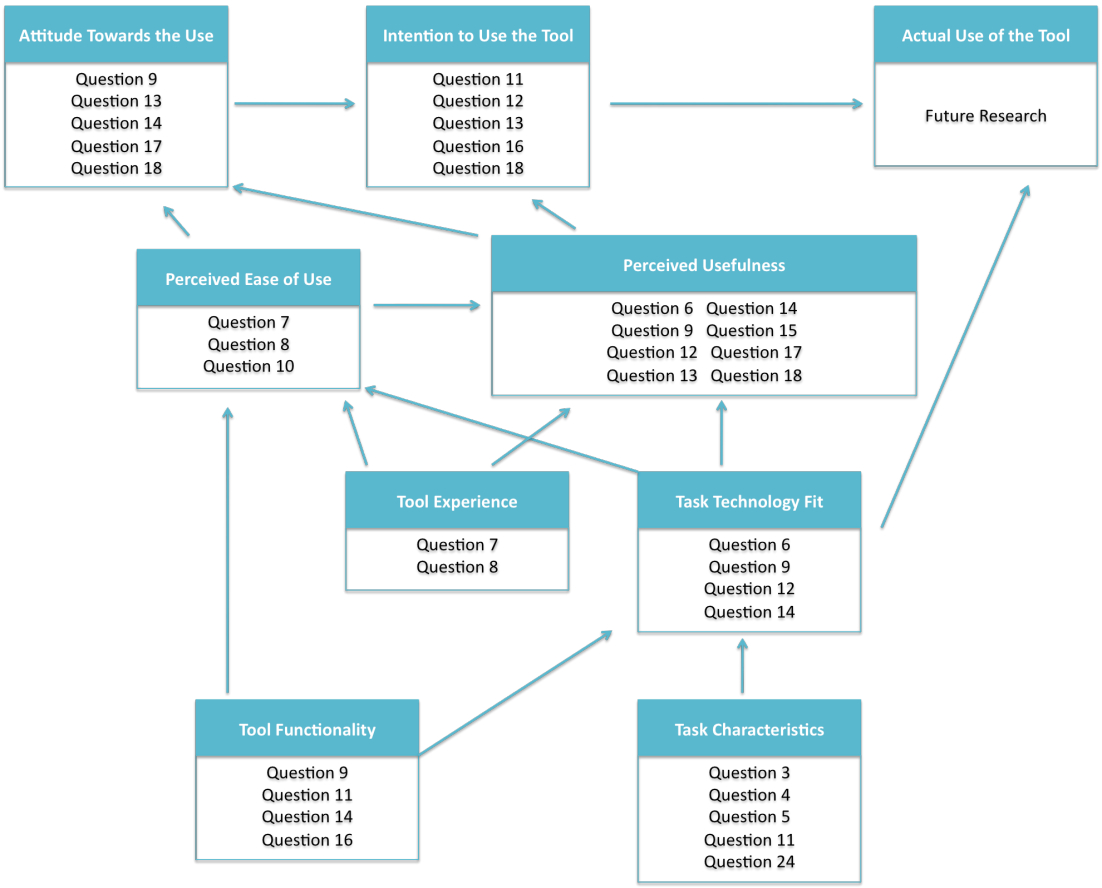

Figure 8 – Theoretical path structure according to Dishaw & Strong (1999)

As previously described in the state of the art, and present in figure 8, Dishaw and Strong (1999) present a connectivity of constructs that belong to the technology acceptance model (Davis, 1985) and the task technology fit model (Goodhue & Thompson, 1995). These constructs (also referred as nodes) were linked through paths validated in Dishaw and Strong's study (1999) and serve as a base to connect the questions proposed for the survey in this dissertation.

As figure 8 shows, all constructs were addressed by a minimum of two questions, in order to maximize potential explanatory variables regarding the hypothesis posed. All questions-construct relationships were explained in the previous sub-chapter and the statistical analysis aims to validate significant paths among them in order to reach conclusions on what drives implementation and usage of the technology in Portuguese companies.

The construct “actual use of technology” is referred as “future research” due to limitations of this dissertation.

3.5 Survey

As stated in the beginning of this sub-chapter, the proposed questions of this survey arise from Dishaw and Strong’ theory (1999) based in Davis (1985) and Goodhue & Thompson (1995). To assess the value of this technology, these questions consider task dimensions, technology implementation, experience, acceptance and use, perceived value in specific uses of the technology in the workplace (Davis, 1985, Goodhue & Thompson, 1995, Dishaw & Strong, 1999).

Exhibit 1 details all questions, including the scale and answer typology used for each answer and Exhibit 2 resumes all the survey questions previously incorporated in the model dimensions.

3.5.1 Survey ranking methodology

In order to present the questions to the targeted audience and based on literature regarding data analysis (Trochim, 2006, Trochim & Donnelly, 2008), the answers follow a Likert scale (Likert, 1932) in order to provide a range of likeability or value assessment. The range is based on 4-option answers, forcing respondents to give a positive or negative opinion (Trochim & Donnelly, 2008). According to the questions previously presented in this chapter, the range hypothesis on the Likert scale varies between rating usage, rating fitness, evaluating usefulness and complexity and rating potential quality of the presented technology related to a situation.

The choice of a Likert scale (Likert, 1932) is due to the fact that the targeted respondents are not using the chosen technology to perform their work; therefore answers are required to be based on perception on the information provided on the survey and an assumption on how employees would use this technology if available.

3.6 Data analysis methodology

The post-survey data analysis focuses on running several statistical tests to understand the relationship between variables in the overall sample and within sectors. These tests have the objective of isolating variables, which would validate hypothesis or answer research questions, and to identify the impact of dependent variables in independent variables.

First it is conducted comparison studies between the overall and all sectors using statistical measures such as the mean, standard deviation, maximum and minimums with the aim of understanding patterns and variance of answers across different clusters.

Next, three linear regression analyses following the proposed model dimensions are conducted. The aim of the regressions is to find predictors that could influence the key variables that sustain the theory from Dishaw and Strong (1999) and see if for Portuguese companies, these predictors present strong responses.

3.7 Chapter conclusion

In chapter IV it was presented the research methodology and how the proposed model linked Dishaw and Strong's theory (1999) with the state of the art and Yammer. First the model construction, detailing the connection with the research questions is demonstrated. Second, Dishaw and Strong's theory and how the author's model relates to employee and company performance is explained in detail. Third, the three hypotheses that will be studied for validation in order to answer the research questions are presented.

Following the hypothesis, the research methodology is presented, where the independent, dependent and control variables are defined and the three sub-dimensions based on Dishaw and Strong's theory are presented and explained. Finalizing the explanation of the sub-dimensions is the path structure presented by Davis (1985), Goodhue & Thompson (1995) and later connected by Dishaw and Strong (1999).

To end this chapter, the survey and its questions, as well as the scale used to assess answers and the data analysis process used for the discussion chapter are presented.

The next chapter analyzes the results from the survey and connects these results with the model presented previously.

IV. Discussion

4.1 Chapter introduction

This chapter presents the discussion and analysis of results from the online survey provided in the previous section. This chapter starts with the research survey and description of the sample, following to the result analysis for each of the sub-dimensions explained in the research methodology. For each sub-dimension is conducted a linear regression and presented the consequent path structure. In order to deploy the online survey it is used the Research Suite from Qualtrics[13] and to analyze the results it was used the statistical package IBM SPSS Statistics 21[14]. These results are analyzed following guidelines in Pallant (2010) and with assistance from Laerd[15]. The regression analysis follows the guidelines from Kupper et al (1998).

4.2 Research Survey

The survey that was used to serve the results for this dissertation was deployed across multiple sectors and multiple companies per sector, in order to reduce any potential bias, both at an overall analysis as well as in a sector-based analysis. In the beginning 13 sectors were targeted with the online survey, but only 5 sectors reached a significant sample size (the defined threshold for the sample size was around 30 answers per sector, based on the theory of the central limit theorem (Hoeffding, 1948, Rice, 2007). All targeted sectors are service providers, demonstrate client relationship, and have at least a minimum technology usage.

[13] http://www.qualtrics.com/research-suite/#enterprise
[14] www.ibm.com/software/analytics/spss/
[15] https://statistics.laerd.com/

A total of 181 surveys were started, but only 157 were considered complete and viable for analysis.

The survey was divided in two segments, one aimed for employees at companies and their core-job tasks, and a second segment aimed only at employee who have managerial tasks in their workflow, i.e., employees who are responsible for managing at team on a daily basis. In the collected sample, 40 respondents claimed to be managing a team, while 117 respondents had no managerial responsibilities. The 40 answers for the management study comprised the sample size for the management studies further conducted.

For completing this survey, it was presented a Portuguese version in order to achieve the required traction, especially among sectors with a lower English usage on the workplace. This Portuguese survey was based on the original English survey (see Exhibit 1).

4.2.1 Survey Sample

The survey conducted for the dissertation was sent to a total of 15 different sectors, aiming to have at least 30 answers for each sector to be considered significant for a deeper individual study. From a total of 181 surveys started across 6 sectors, 157 surveys were completed reaching near the threshold, as showed by figure 9.

Sector	Number of respondents
Media	32
Insurance	25
Telecom	30
Consulting	30
Non Profit	31
Other - Not analyzed as sector	9
Overall	157

Figure 9 - Division of respondents by sector

As figure 10 shows, the age distribution is the following: 2.5% of respondents stated to be under 21 years old, 49.7% of respondents are between 22 and 29

years old, 30.6% of respondents answered to be between 30 and 44 years old, 15.9% are between 45 and 64 years old and only 1.3% of respondents are above 65 years old.

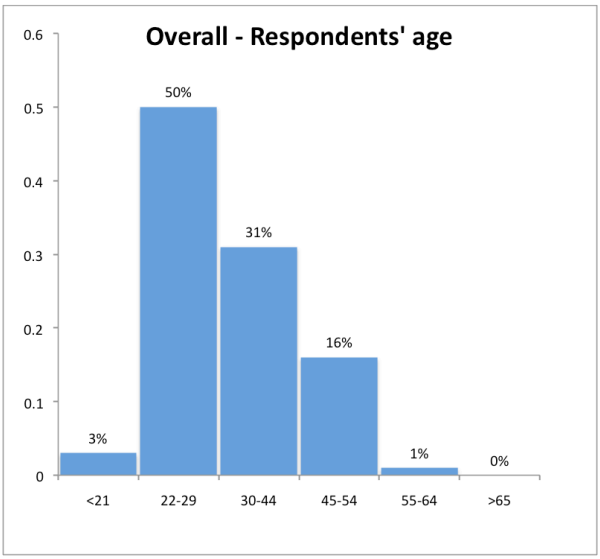

Figure 10 - Overall age distribution

This distribution is mainly influenced by the respondents from Non-Profit, Telecom and Consulting sectors, as respectively observed in Figures 1b, 2b and 3b (see *appendix b*).

Figure 11 shows that 45.2% of respondents are men (a total of 71 answers) and 54.8% of respondents are women (a total of 86 answers).

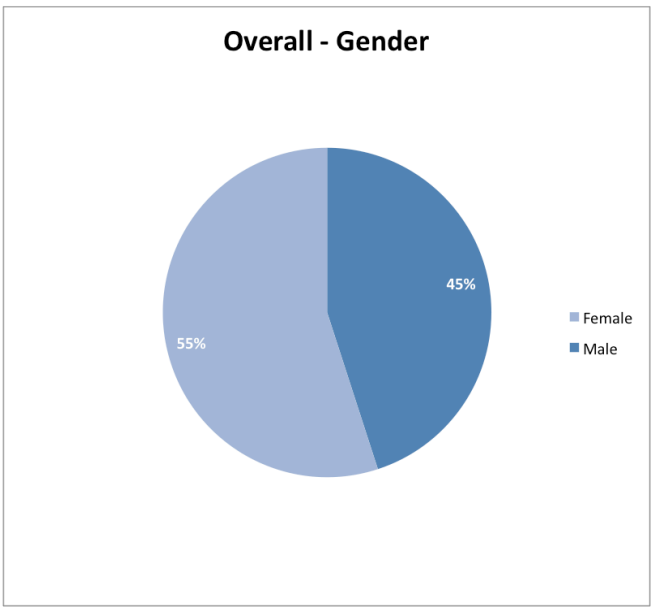

Figure 11 - Overall gender distribution

These are the results of a more prominent male response in sectors such as non-profit and consulting (61% and 63% respectively, as observed on figures 1c and 5c respectively as well), and female response in media and insurance (69% and 85% respectively, as observed on figures 3c and 2c, respectively (see *appendix c*)).

For the final part of the survey targeting only employees with managerial responsibilities, as stated in figure 12, 25.5% of respondents affirmed to have management duties (a total of 40 answers), while 74.5% of respondents said they were not managing any team members (a total of 117 answers).

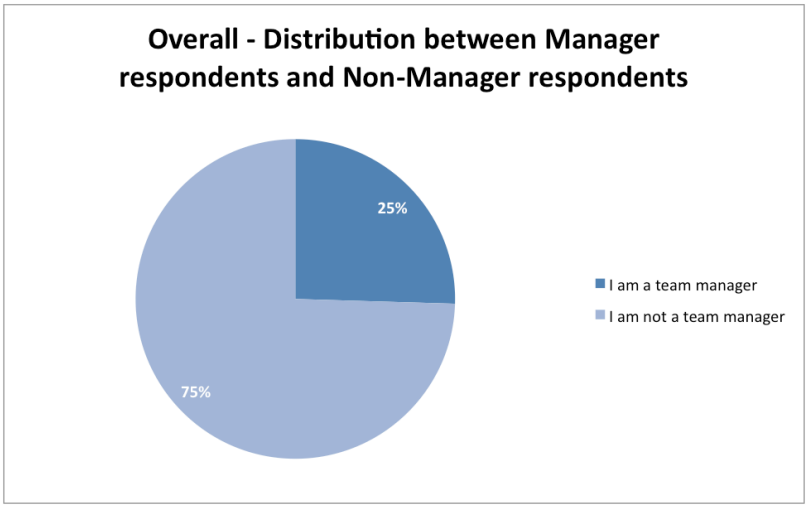

Figure 12 - Overall manager-employee distribution

4.3 Dishaw and Strong's dimensions assessment

According to the model based on Dishaw and Strong (1999) as well as Davis (1985) and Goodhue & Thompson (1995) (see chapter III) this sub-chapter divides the result's assessment in three dimensions. The first dimension analyzes the results from employee's answers regarding their perceived task-fitness of the technology. The second dimension analyzes the task-functionality. Finally, the third dimension focuses only on managers and the perceived task-fitness and task-functionality of Yammer.

4.3.1 Employee Task-Fitness Assessment

This sub-chapter analyzes the results from the questions in the employee task-fitness segment (see sub chapter 3.4.2.1 in chapter III), directly related to the validation of the first hypothesis.

The following figures demonstrate the results from questions 3, 4 and 5, respectively regarding the consumption of data, information, technical tools, as well as the volume of contact with co-workers and external partners to the daily business. Figure 13 show that our representative sample has a significant consumption of expertise, information and technical tool usage on the workplace in order to perform their tasks. With 41% of respondents answering that their use of these resources is relevant, and 45% answering that the usage is high, it is possible to conclude that this variable will directly impact the importance of enterprise social technology in the workplace, if found as a significant predictor of fitness and acceptability (Dishaw and Strong, 1999). Taking the mean as the measure of volume, the results show a 3.25 value in a Likert scale (1 to 4 scale).

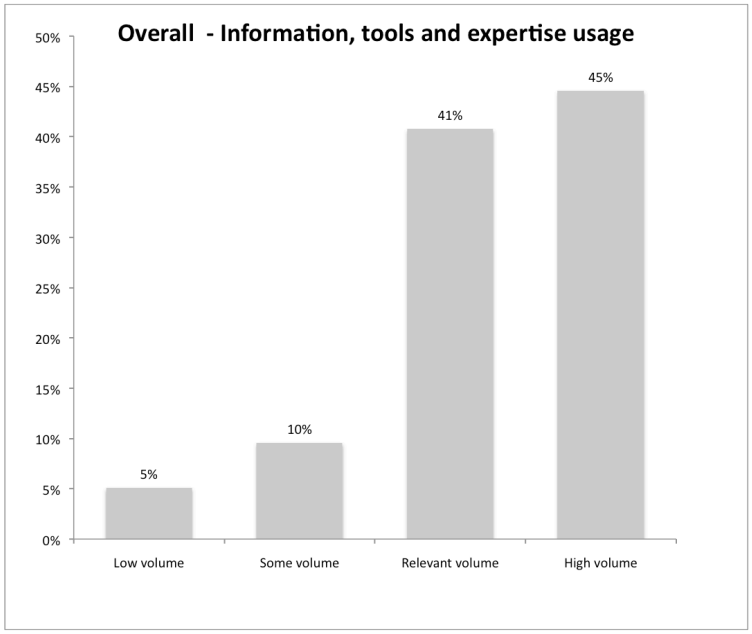

Figure 13 - Overall information, tools and expertise usage

In terms of sectors, Non Profit show a lower "high volume" answer percentage (26% versus 45% in the overall sample as observed in figure 2d) and consulting shows a higher than average "High volume" answer rate (with 57% as observed

in figure 3d). These sectors are the reason for a rather high standard deviation of 0.83 for this answer (see *appendix d*).

Question 4 and 5 analyze the volume of contact that workers in different sectors, and overall, had with their own co-workers and with external partners to achieve their daily tasks. As observed in figure 14, the sample demonstrates contact with co-workers, both in teams and within the company, fluctuates between relevant and high volume (respectively 43% and 51%). This concentration is significant, demonstrated by a low standard deviation of 0.63.

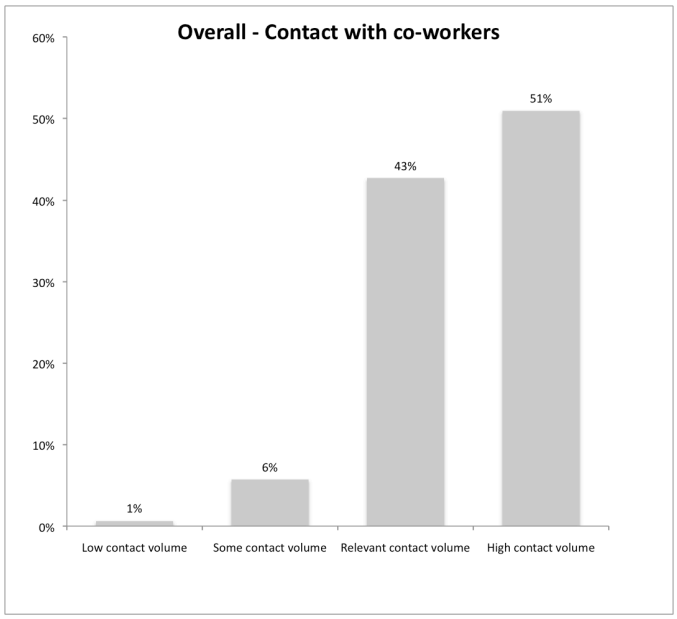

Figure 14 - Overall volume of contact with co-workers

In the case of external partner volume of contact, figure 15 demonstrates that answers are scattered through all options, with a slighter emphasis on relevant volume of contact with external partners (40%). This affirmation is also supported by the higher standard deviation (1.01).

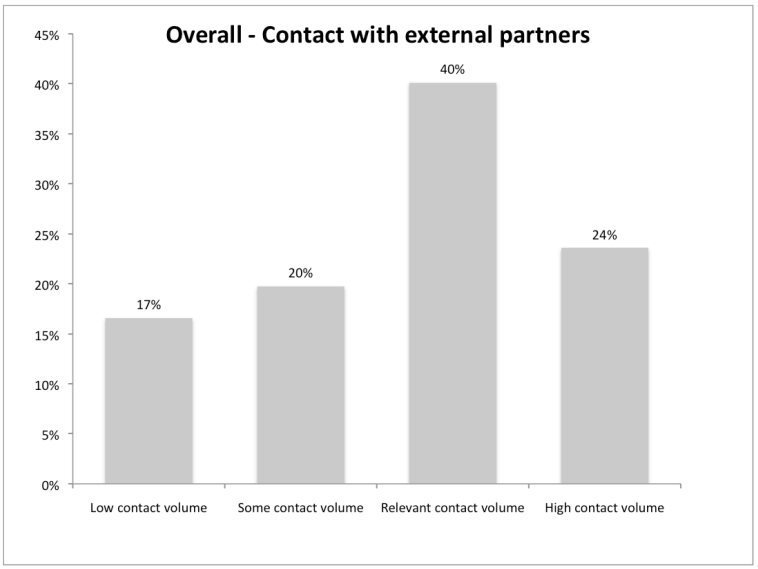

Figure 15 - Overall volume of contact with external partners

In terms of sectors, the main responsible for this deviation are Telecom respondents (as observed in figure 4e), with a 43% of answers in the "low contact volume" and Media (see figure 5e), where 81% comprise the answers between relevant and high volume of contact with external partners (see *appendix e*).

Considering a statistical comparison of means between questions 3, 4 and 5 (see figure 16), it is possible to see that, for the sectors analyzed, both the utilization of data, technological tools and expertise, as well as co-worker contact to fulfil daily tasks are significantly heavy, with respectively 3.25 and 3.44 on the Likert Scale from 1 to 4. The contact with external partners in this case has a lower respondent rate in this same scale, with a mean of 2.71, but shows a higher standard deviation (1.008), meaning that different sectors have a different relationship, already emphasized in the graph analysis.

Report			
	Utilization of data, tools and expertise in the workplace	Contact with co-workers	Contact with external partners
Mean	3,25	3,44	2,71
N	157	157	157
Std. Deviation	0,829	0,634	1,008

Figure 16 - Mean comparison table 1

Question 6 focuses on analyzing what is the perceived fitness of enterprise social technologies considering the tasks and daily routines of employees in different sectors. As observed in figure 17, 61% of respondents perceive the technology to be fit (43%) or with high fit (18%) versus only 12% answering "low fit". With a rather high standard deviation value (0.91), it is expected that different sectors analyze this fit differently. On the Likert scale (1 to 4) the mean for the technology fit question was 2.67.

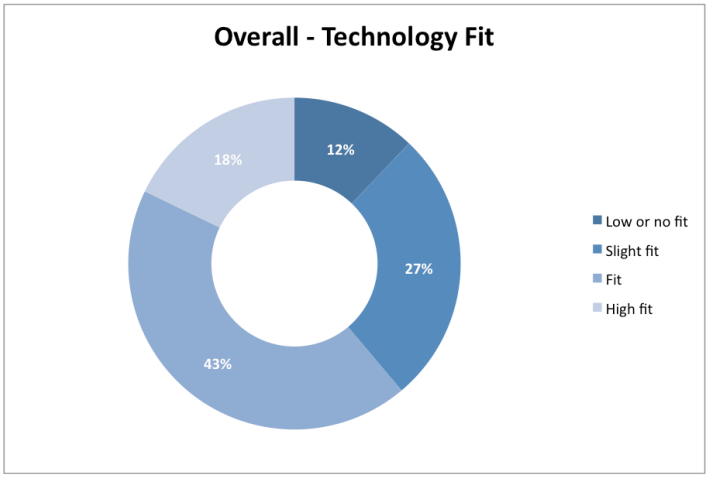

Figure 17 - Overall perceived task technology fitness

Analyzing the sectors, although Consulting and Telecom demonstrate the highest percentages of "low fit" answers (23% and 20% respectively), they also demonstrate the highest "High fit" answer rate (30% and 40% respectively, versus the overall value of 18% (see figures 4f and 5f in *appendix f*).

Question 7 focuses on understanding what is the percentage of companies within the analyzed sectors that are currently using any enterprise social network products in their workday. As observed in figure 18, 63% of respondents affirmed that their companies are not using social technology for their business tasks. With a standard deviation of 0.53 it is expected for sectors not to vary.

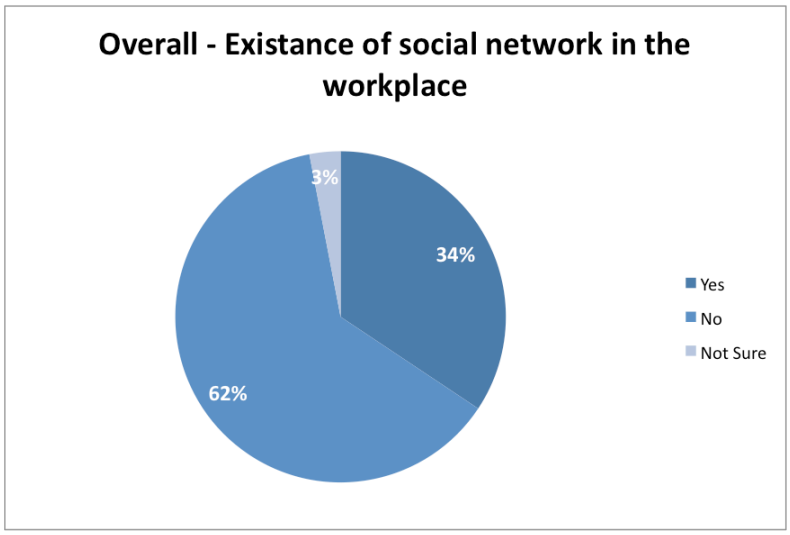

Figure 18 - Overall existence of social network in the workplace

Question 8 was posed to understand what was the average experience with social networks among Portuguese companies on the analyzed sectors, as well as the overall of the sample. As observed in figure 19, 70% of respondents affirm to have relevant experience (40%) or high level of experience (30%) with social networking tools. With a mean of 2.96, it is safe to assume that overall Portuguese employees in the analyzed sectors are expected to have relevant experience with social networks, although this is a value potentially correlated with the age and the type of service provided.

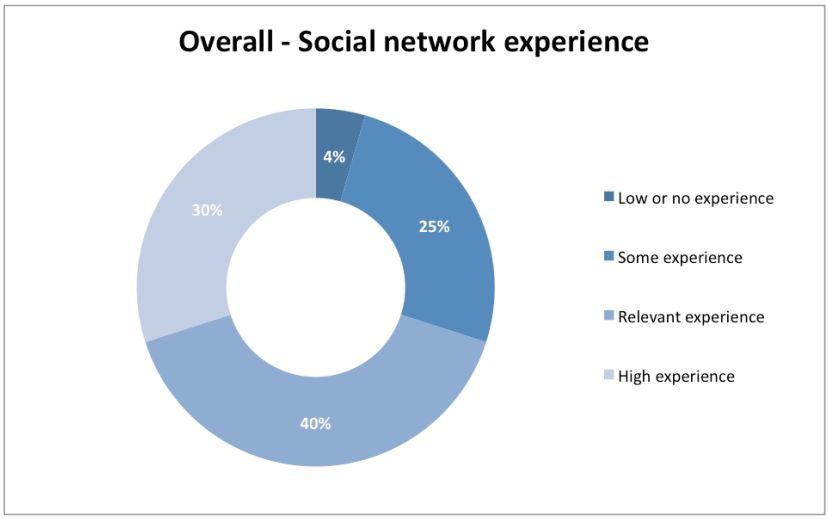

Figure 19 - Overall social network experience

4.3.2 Employee Functionality-Fitness Assessment

The employee functionality-fitness assessment sub-chapter analyzes the results from the questions related with the validation of the second hypothesis.

Question 9 focuses on understanding the advantages that employees possibly believe to benefit from having this technology available in their workplace to help achieve their tasks. A set of 10 advantages were posed based on the description of Yammer's key advantages (Yammer.com) and, according to figure 20 the top 4 advantages selected by respondents were "improves connection among teams" (57%), "increases the speed of accessing knowledge" (54%) and "increases the knowledge in the company" (50%). These 3 fields are related with communication, access to contents and speed of reaching expertise. On the negative side, the least perceived advantages are "increase of productivity" (18%) and "technology integration" with existing technology in the company (24%).

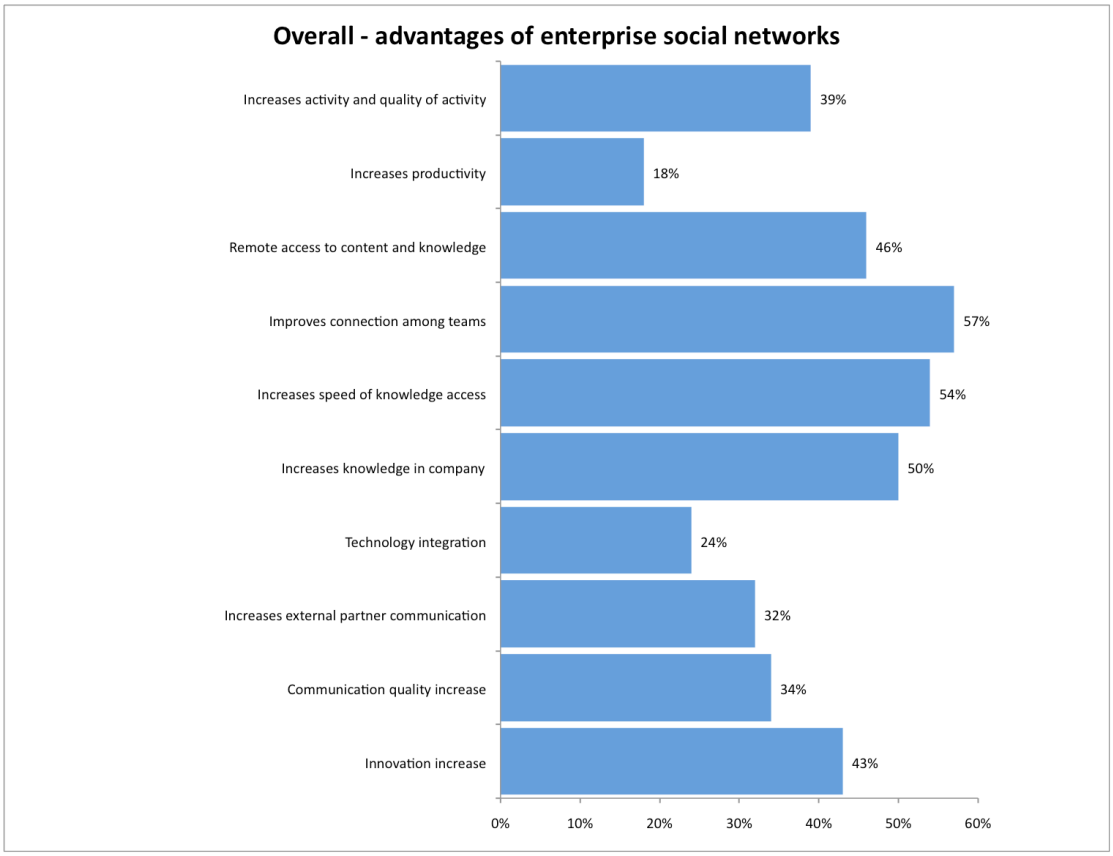

Figure 20 - Overall advantages of enterprise social networks

On question 10 it was asked what is the perceived ease of learning and utilizing the technology and its features to achieve daily tasks. According to figure 21 it is significant the ease of learning and utilizing this technology, with a mean of 3.38 in a Likert scale from 1 to 4. 48% of respondents said that learning the technology would be somewhat easy, and 46% of respondents said it would be in fact easy. Only 3% of the answers stated that it would be difficult to learn and utilize the tool in the workplace.

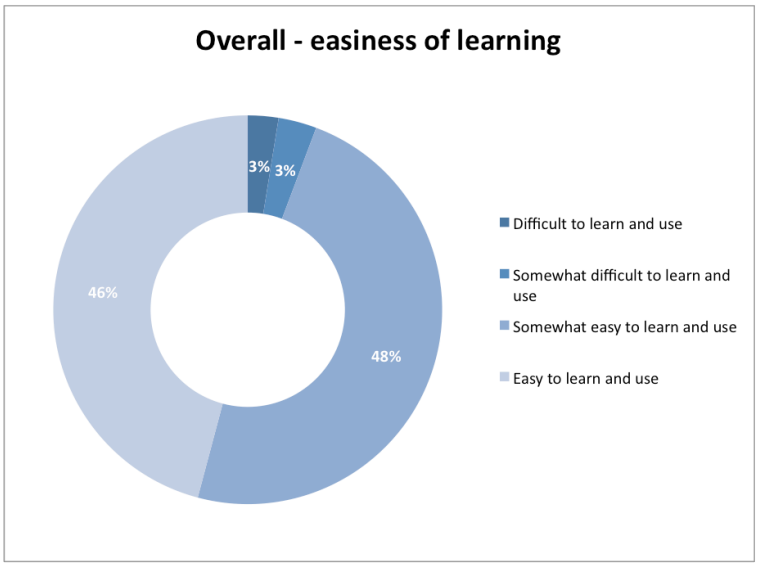

Figure 21 - Overall perceived easiness of learning enterprise social

In specific sectors, according to figure 1g and 3g, Non Profit and Consulting sectors demonstrate a higher than average ease of learning (respectively 55% and 57%). These values are potentially tied to the younger average age of responders in these sectors.

Question 11 focused on understanding for which tasks was Yammer a more suitable technology, on an employees' perspective. With means varying between 2.58 and 3.18 in a Likert scale from 1 to 4, it is clear that, on average, employees would likely use Yammer for the majority of selected general tasks. Managing and communicating corporate initiatives, with a 3.18 is the highest rating task where social enterprise technology would be used, taking into advantage the social network and communication features, and access to performance data being the least voted task with a mean of 2.58. Also in highlight is the average of 2.93 of accessing market information and research on expertise knowledge, demonstrating the benefits on accessing specific contents of information by employees (see figure 22).

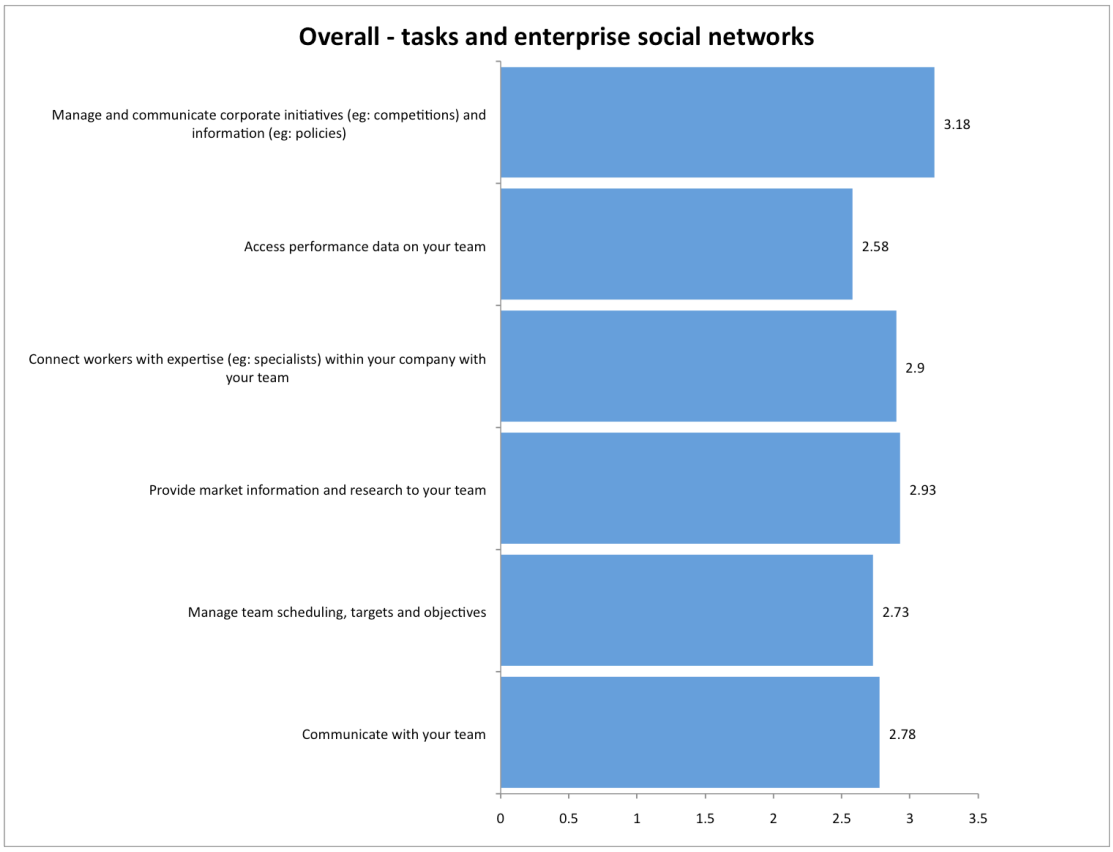

Figure 22 - Overall tasks perceived to fit enterprise social networks

Questions 12 and 13 were posed to analyze the likelihood of an employee using the tool, if it was available in the workplace, and how important would be a manager, or the management team, to promote the usage of the technology to be adopted on the daily routine. For question 12 it is possible to observe figure 23, where a mean of 2.83 indicates clear likelihood of utilization, with 49% of respondents saying they would likely use the technology, and 19% of respondents saying they would highly likely use the tools. Only 4% responded negatively regarding their potential use of the tool. The standard deviation of 0.79 is derived from employees in Insurance and Consulting (see figure 1h and 3h in *appendix h*) where 40% and 33%, respectively, affirmed that only maybe they would use the tool.

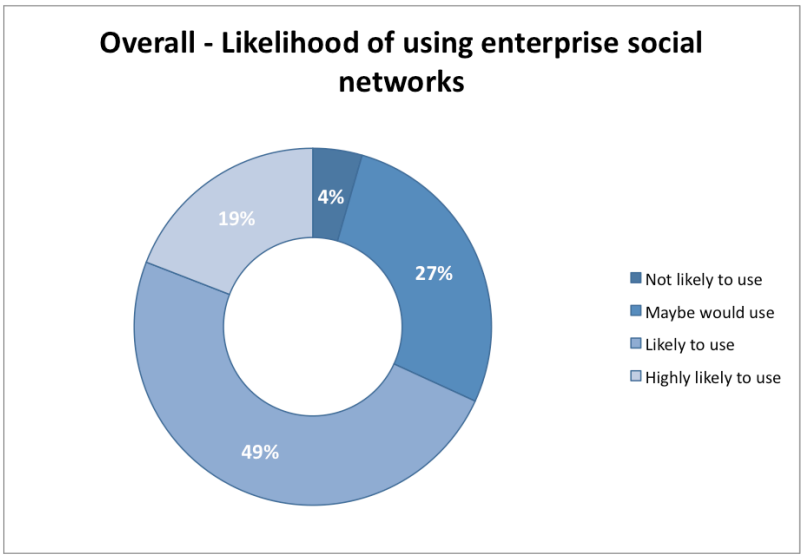

Figure 23 - Overall likelihood of using enterprise social networks

Regarding the management support, it is possible to observe in figure 24 that the mean is 2.95 in the 1-4 Likert scale, indicating a significant importance in managers to promote and communicate the usage of enterprise social technology to their employees. 45% of respondents affirmed it was important, and 27% of answers were in the maximum bracket, indicating the highest need for management promotion.

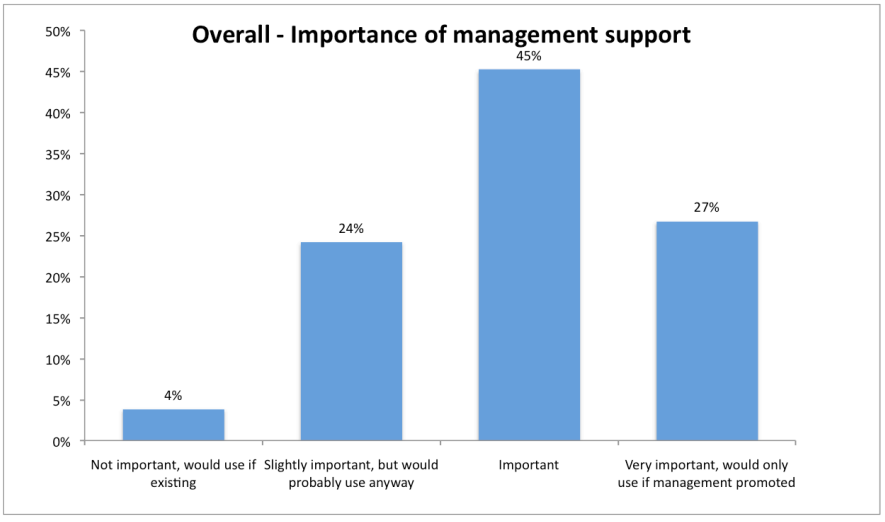

Figure 24 - Overall importance of management promotion and support

In terms of comparing the means of questions 6, 8, 10, 12, and 13 (see figure 25), it is possible to see that the average experience with social networks is

significantly high, with a 2.96 mean in the Likert scale as well as the perceived ease of learning and using the technology (with a 3.38 mean). In terms of fitness, the resulting mean is lower then the average, with a 2.67 from 1 to 4, but the higher standard deviation of 0.909 indicates that the answers were rather scattered, either by sectors or within employees in each sector.

Report

	Experience with social networks	Task technology fitness	Easiness of learning Yammer	Likelihood of using the technology in the workplace	Importance of promotion of the technology by management
Mean	2,96	2,67	3,38	2,83	2,95
N	157	157	157	157	157
Std. Deviation	0,857	0,909	0,674	0,786	0,815

Figure 25 - Mean comparison table 2

4.3.3 Management Functionality-Value Assessment

Finally, sub-chapter 4.3.3 analyzes the results from the questions linked to the validation of the third hypothesis as previously explained in the model. The management analysis was conducted solely to employees who, beyond their own core job tasks, also had managerial duties or responsibility of managing a team of employees within their company. As previously observed in figure 12, out of the total sample, 25% of respondent's answers positively to being in charge of a team, independent of its size.

On figure 26 it is possible to analyze the results of perceived advantages and usefulness of this technology from a manager's point of view. With 68% of choice among respondents, "communicating with their team" through the chat and communication features is a preferred advantage of having this tool available. With 53% and also slightly related to the first choice, "improving the connection between the team", mainly through interactive features, relationship features or passive connectivity is also a preferred advantage of using the tool. Tied in the third place with 45% of choice among manager answers are "increased quality of messages broadcasted", related with the active and continuous communication

within the team and within the company and the relevance of these messages for daily business tasks, and also with 45% of choice is the capacity to access content and communication with the team remotely, through mobile devices. All preferred features are directly connected with communication and reaching co-workers or external partners.

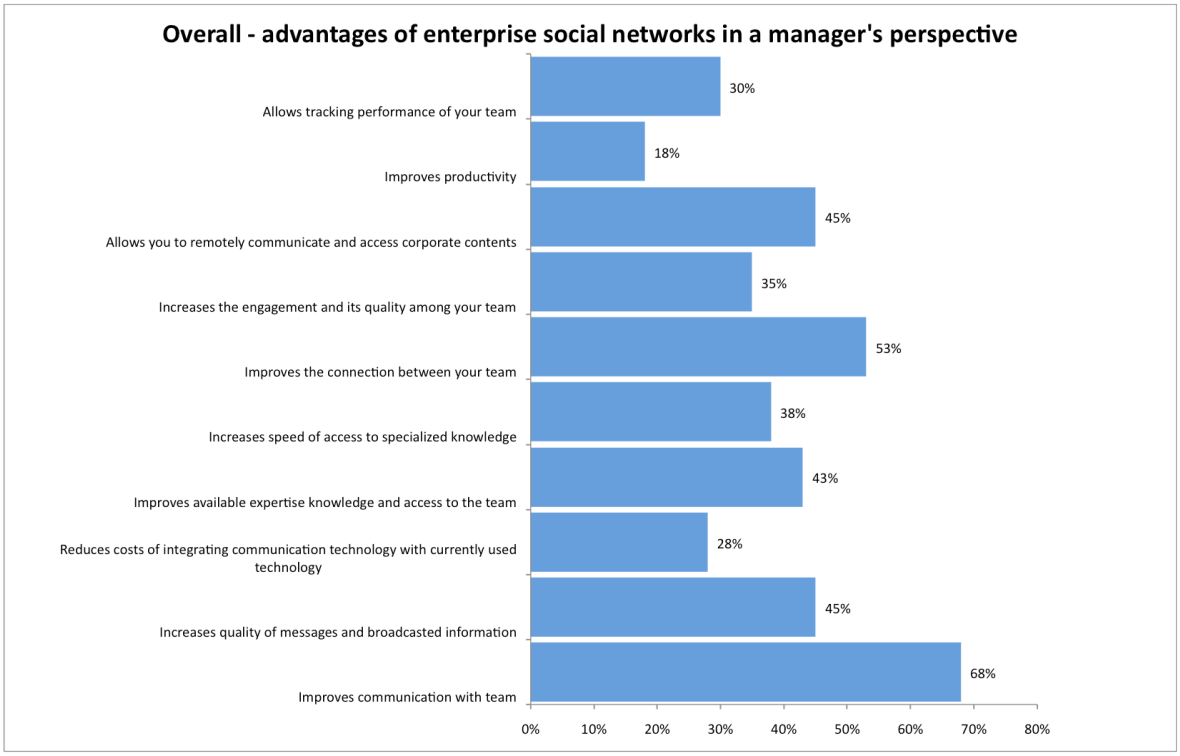

Figure 26 - Overall advantages of enterprise social networks in a manager's perspective

On figure 27 it is possible to conclude that managers find this technology useful, with a mean of 2,70 in a 1-4 Likert scale. With 48% of managers finding the technology useful and 18% finding it very useful, a total of 66% offer a positive answer versus only 13% of managers finding the technology not useful and 23% finding it slightly useful. The standard deviation of 0.91 is sufficiently high to determine that certain sectors might deviate from the overall perception, or possibly that managers within companies still have different opinions.

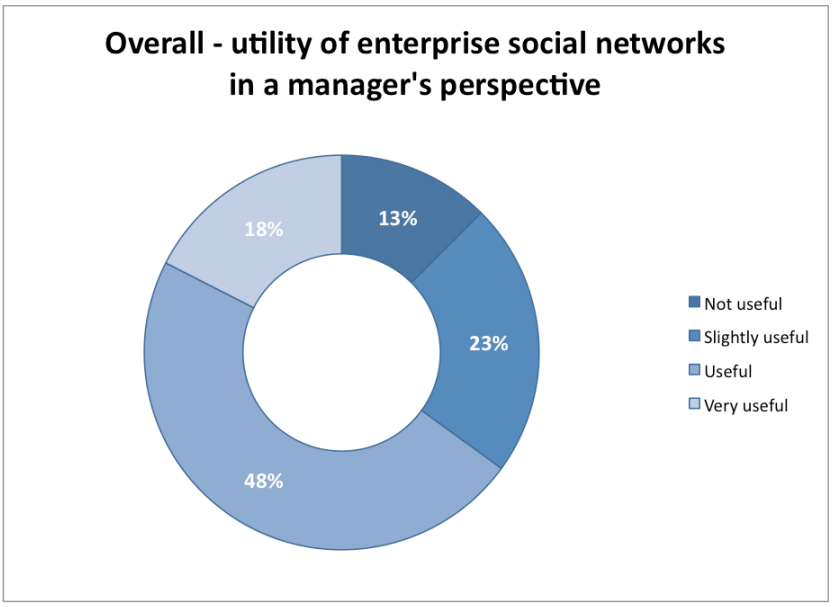

Figure 27 - Overall perceived utility of enterprise social networks in a manager's perspective

Question 16 was asked to understand what is the connection of enterprise social network Yammer and its features and managers tasks. As observable on figure 28, from 1 to 4, answers vary between 2.58 and 3.18, clearly demonstrating that managers would likely use this technology for the majority of their job duties. Mimicking results from the same question from an employee's point of view, communicating corporate initiatives and important messages to their team and company rates with a 3.18, the highest mean value.

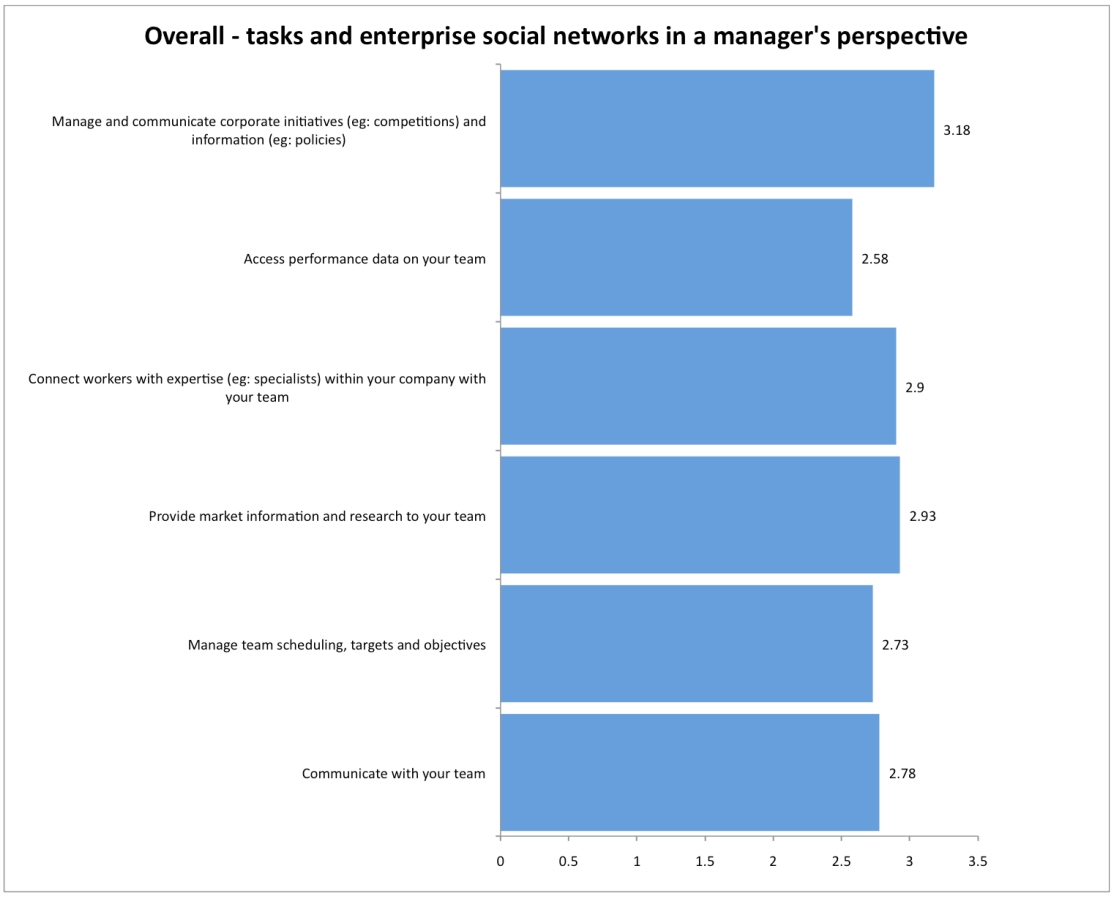

Figure 28 - Overall tasks perceived to fit enterprise social networks by managers

The final questions, 17 and 18, focus on understanding the impact of having employees demand access to enterprise social technology (or demonstrating necessity or desire) versus no demand demonstration, and how that reflects on the likelihood of a manager implementing or proposing the implementation of this technology to their IT department in the future in their own companies. Without knowing any demand or necessity from their employees, managers affirmed that they are likely to implement or propose the implementation of the technology, resulting in a mean of 2.75 in a Likert scale (1 to 4 scale). Figure 29 demonstrates that 58% of managers answered that they would implement and 13% answered that they would definitely implement or propose this implementation in the future, versus only 8% stating it would be unlikely for them to have this technology available in the future. After providing a scenario where their employees stated interest in having this technology available, the mean increased more than 10%, jumping to 3.03 in the same 1-4 scale. This

increase in the mean is highly significant to demonstrate that root movements impact the perceived utility of technology (Bughin, 2008).

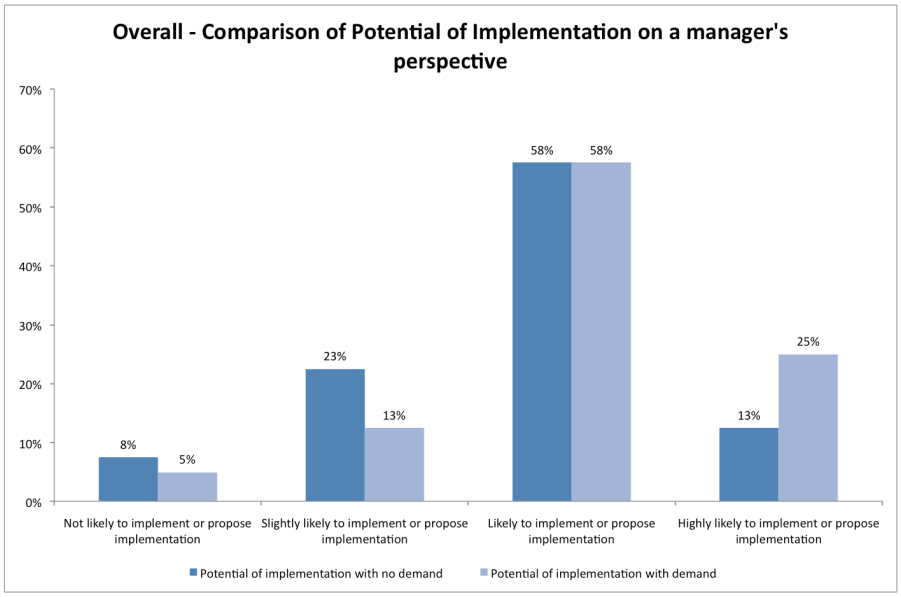

Figure 29 - Comparison of potential of implementation of Enterprise social networks in a manager's perspective

4.4 Linear regression analysis

This sub-chapter provides the results from the linear regressions conducted on the variables of sub-chapter 3.4.1.3 in chapter III. As explained in the sub-chapter "*Data analysis methodology*", each respective linear regression is directly linked with the validation of its hypothesis. Each linear regression ends with the demonstration of Dishaw and Strong's path structure (1999).

4.4.1 Employee task-fitness linear regression analysis

The first linear regression analysis focuses on finding the significant predictors (independent variables), which explain the perceived fitness of enterprise social network Yammer (dependent variable), to the general tasks of employees in the analyzed sectors. The significance threshold is a p-value below 0.05.

The results from the linear regression, considering a p-value threshold of 0.05, indicate that only the constant, volume of contact with co-workers (question 4) and likelihood of using the technology if available (question 12) are significant for the regression equation (respectively, p-value of 0.04, 0.029, 0.00).

According to *appendix i*, figure 1i indicates a high correlation value of 0.713 and an R-squared value of 0.508. This means that the predictors explain approximately 50.8% of the independent variable. Figure 2i shows that the linear regression is statistically significant, with a p-value of 0.000 (the p-value threshold is 0.05).

According to figure 3i the coefficients from predictors that were previously determined as statistically significant offer the following equation:

Perceived Technology Fitness = (-1.170) + 0.216(volume of co-worker contact) + 0.747*(likelihood of using technology)*

The coefficients of the predictors demonstrate that the higher the volume of contact with co-workers, the higher will be the perceived fitness of the technology, although not very impactful. The second coefficient, which has a high impact, demonstrates that the likelihood of using this technology, if available in the workplace, is a strong predictor of finding the same technology task-fit.

Considering the model described in the previous chapter, the predictors found significant and their respective questions, it is possible to trace the node relationship towards the dependent variable (see figure 30). The linear regression validated path c), where task characteristics directly affect the task technology fitness (Goodhue & Thompson, 1995, Dishaw & Strong, 1999). Another conclusion reached by the regression is that, for employees in Portuguese companies for the sectors analyzed, there is a relationship between intent to use and the perceived fitness of the technology. Although this path is

not directly considered in theory, this study found it to be the strongest predictor.

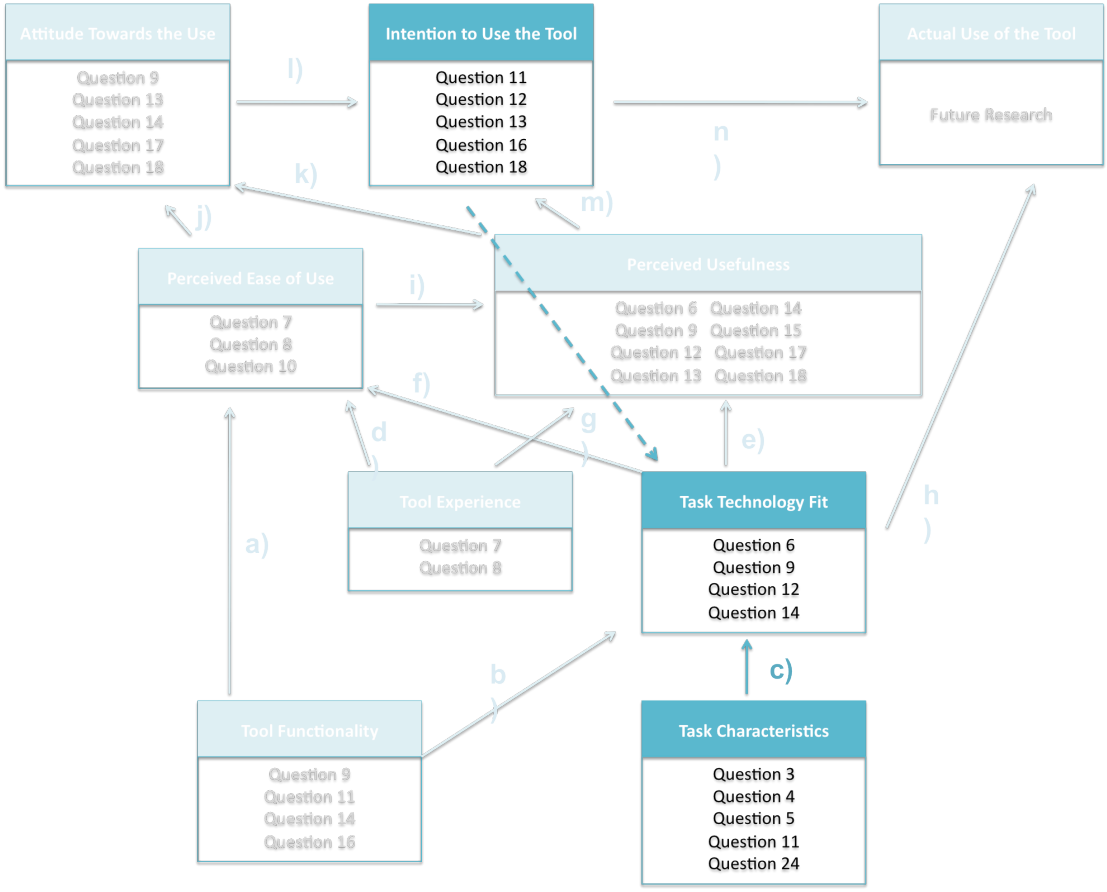

Figure 30 - Path structure of Employee task-fitness linear

4.4.2 Employee functionality-fitness linear regression analysis

In order to understand which of the variables (independent variables) could be significant predictors to determine the likelihood of employees using this technology if available at work (dependent variable), it was ran a linear regression. The significance threshold is a p-value below 0.05.

Considering the results from the coefficients and considering the p-value threshold of 0.05, only the constant (p-value = 0.003), contact with co-workers to fulfil daily tasks (p-value = 0.033), volume of contact with external partners (p-value = 0.006) and perceived fitness of the technology related to their tasks (p-

value = 0.00). All other values presented p-values above 0.05, meaning that they were not statistically significant to be considered as predictors.

The model summary shows a significantly high value of correlation with an R-value of 0.718 (see figure 1j – *appendix j*) and an R-squared value of 0.516. Although the R-squared value not being significantly high, the valid predictors still explain 51.6% of the dependent variable. As demonstrated in figure 2j, it is possible to conclude that the linear regression is statistically significant, with a p-value below the threshold 0.05, leading to the presentation of the significant predictors.

Considering now the results from the coefficients (see figure 3j) that were previously determined as statistically significant, the linear regression equation can be determined through the unstandardized coefficient betas (B):

Likelihood of utilizing the technology = 1.455 + (-0.181)(volume of co-worker contact) + 0.141*(volume of external partner contact) + 0.550*(perceived fitness)*

By analyzing now the coefficients of the predictors, what the equation demonstrates is that the higher the volume of contact with co-workers, the lower will be the likelihood of using the technology. On the other end, the higher the volume of contact with external partners, the higher will be the likelihood that employees will use the technology if available. Finally, with the strongest relationship coefficient, the higher the perceived fitness between the technology and the tasks, the more likely would be for employees to use the technology if available.

These conclusions demonstrate that companies with a pattern of business that involves employees working somewhat by themselves, but with high levels of contact with suppliers, customers or business partners and that show a good technology relationship and positive reaction when faced with enterprise social networks are highly likely to become active and high-volume users of this technology, potentially offering the best value-for-money of investing in ESN service providers.

Again considering the model described in the previously, the linear regression validated path c), e) and m), as showed by figure 31. Respectively, task characteristics affect directly perceived technology fitness, which affect perceived usefulness and finally intention to use the tools (Davis, 1985, Goodhue & Thompson, 1995, Dishaw & Strong, 1999).

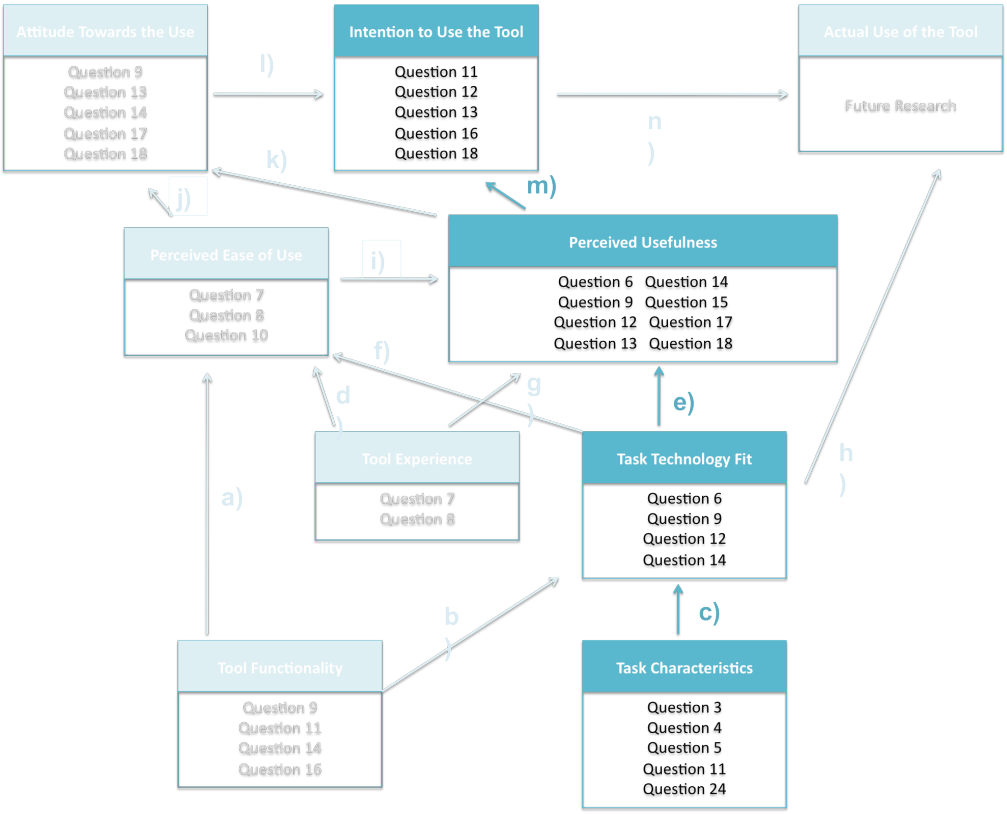

Figure 31 - Path structure of Employee functionality-fitness linear regression

4.4.3 Management task-and-functionality-fitness linear regression analysis

As can be observed in *appendix k*, running the linear regression based as the dependent variable the probability of implementing the technology in the workplace regardless of any external factor, the only significant variables that integrate the regression (due to a p-value below the selected threshold of 0.05) are the probability of utilizing the technology from an employee point of view

(not considering the managerial tasks), and knowing that employees demand this technology as a need to better perform their work.

The model summary (see figure 1k) indicates that there is an exceptionally high correlation, with an R-value of 0.898 and an R-squared of 0.720. This means the two significant predictors explain 72% of the dependent variable. The ANOVA table (see figure 2k) shows a significant p-value of 0,000 (below the 0.05 threshold), demonstrating that the regression is significant and the predictors are viable to be discussed.

Taking into account the results from the coefficients in figure 3k, the linear regression equation can be determined through the unstandardized coefficient betas (B):

Probability of technology implementation = 0.370(likelihood of utilizing the technology) + 0.415*(impact on probability of implementing, knowing demand or desire from employees)*

Considering the coefficients of the predictors, what the equation shows is that for each level increased in perceived utility of the technology to fit the tasks of the manager, a positive impact of 0.573 will occur in the probability of implementing the technology. Also, for each level of impact from knowing a demand or desire from employees on having this technology available to complete their tasks, a positive impact of 0.415 will occur to the probability of implementing the technology.

This section of the study demonstrates that making managers aware of the value and capabilities of a enterprise social technology, and demonstrating demand from employees regarding having this technology accessible in the workplace will increase the probability of a manager implementing or proposing the IT department for an implementation of these tools in their own companies.

This information is relevant for ESN vendors, who need to demonstrate to the decision-makers the value of this technology as well as to employees to generate a necessity of accessing such features.

Finally, considering the model described in the previous chapter, the linear regression validated paths m), k) and l) (see figure 32). Respectively, perceived usefulness affects intention to use the tool, as well as the attitude towards using the technology (Davis, 1985, Goodhue & Thompson, 1995, Dishaw & Strong, 1999).

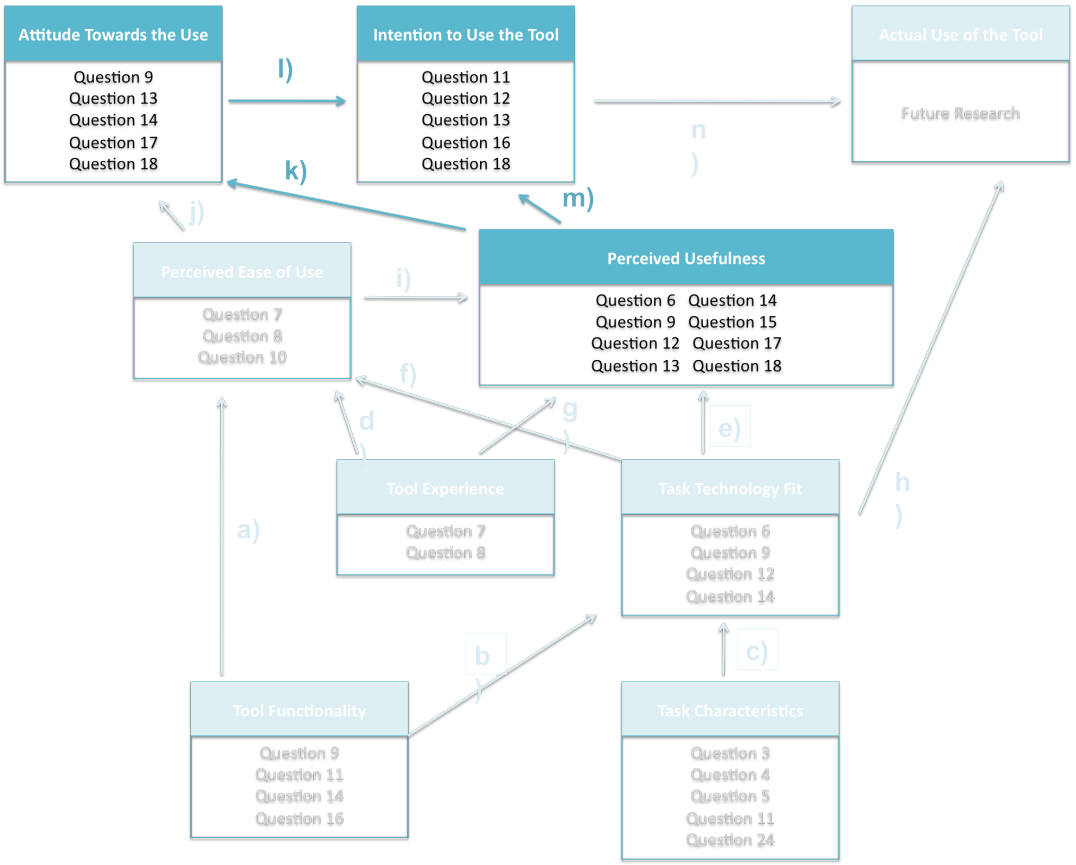

Figure 32 - Path structure of Management task-and-functionality-fitness linear regression

4.5 Chapter Conclusion

This chapter analyzed the results from the survey providing visual insights on how respondents viewed their relationship with enterprise social networks. Next it was demonstrated a link between the results and the model discussed in chapter III, offering significant statistical equations that will lead to the validation and answering of hypothesis and research questions.

The next chapter will provide the conclusions based on the discussion of the results, including the validation of the 3 hypothesis and answers to the 3 research questions. Complementing these results, the next chapter also highlights some limitations and offers future fields of research around enterprise social networks.

V. Conclusions

5.1 Chapter introduction

This chapter presents the main conclusions after analysing the results from the online survey. The conclusions serve as the base to validate or exclude the proposed hypothesis, and as a consequence answer the research questions asked in the beginning of the dissertation. In the end some limitations on this research study as well as future research topics around enterprise social networks are presented.

5.2 Hypotheses Conclusions and Research Questions

The first research question posed in the dissertation has the objective of understanding a potential penetration rate of enterprise social technology in various sectors in Portuguese companies:

> *1. Are current Portuguese companies using any enterprise social networks to connect employees internally?*

In order to answer the first research question, the online survey included a direct question on whether respondents would state if they were currently utilizing or not any enterprise social tool in their workplace, or if they were not sure if using any of these technologies.

According to the results studied in the previous chapter, the majority of employees are not using any social network technology fully focused on the business context or business contents, where **62% of respondents stated that they were not using any enterprise social technology in their company** (as observed in Figure 18). Still, one third of employees (34% as observed in Figure

18) affirmed that they were currently using some sort of social technology in their company to fulfill their tasks. Finally, a minority of employees was not sure if any of the tools available in the workplace belonged to the "enterprise social" class. Sectors such as *Non-Profit* and *Insurance* demonstrate a lower penetration of the technology, with rates above 70% reporting negatively. On the other hand, *Media*, a highly client-centric activity reported to have nearly 60% of employees using enterprise social networks (see Section 2 - Table 5).

Concluding, **the majority employees in Portuguese companies are not using any social technology tools to perform their job tasks.** Nonetheless, further research at a company-wide, role-wide and sector-wide level should be conducted to understand the real penetration of enterprise social products in companies, crossing with the rates of respondents who answered negatively. Some sectors with a more traditional approach to customer care, or even lower activity between team members will potentially generate more obstacles towards the introduction of such tools. Other sectors, such as *Non Profit*, where data usage and expertise access is not as prevalent might also not benefit as much from accessing a tool such as Yammer.

The second research question posed in the dissertation focuses on understanding what was the current relationship between employees in the sectors analyzed and the concept of enterprise social networks, the knowledge of the advantages of having access to these tools and how they perceived this technology to be adequate to their daily task requirements:

> *2. Are employees aware of this technology, its advantages and do they believe it fits their jobs?*

Concerning the utilization of knowledge and data, as well as the contact with stakeholders in the daily business, most of employees in Portuguese companies from the analyzed sectors are currently using data, information, expertise and technological tools to perform their jobs on a daily basis. More than 90% of employees stated that their usage of information, data and expertise was

significant (see figure 13). To complement these results, the majority of respondents affirmed that their contact with co-workers is significant (94% according to figure 14), as well as with external partners to the business (see figure 15). It is confirmed that employees in sectors such as Non-Profit tend to use less data or expertise, as Table 6 indicates, although the limitation on the roles of respondents in the company can shift this premise. Employees from sectors such as *Consulting* and *Telecom* clearly indicate that contact with external partners is lower than average, potentially due to task-requirements being more team-centric (see Figures 3e and 4e in *appendix e)*.

In relation to the experience with the technology and the perceived fitness of the tools to daily job requirements, the majority of employees are either fluent with social networks and their utilization or have significant experience (figure 19 shows that 70% of respondents chose one of these options). Also, the majority of employees found the presented tool to be significantly adequate to perform or improve performance in their job (see figure 17). Concerning the sectors, *Consulting* and *Telecom* employees do not perceive this technology as fit as others sectors, with more negative answers than positive (see Figures 4f and 5f in *appendix f)*.

These results, as demonstrated in chapter III, are directly related with the first hypothesis from the employee task-fitness dimension:

> *H1: Tasks from Portuguese employees are adjusted to the functionalities provided by enterprise social networks*

H1 allows to partially answer the second research question, specifically regarding the perceived fitness of the tools' features to the employee's job. In order to go deeper in the validation of the hypothesis, a linear regression was run with the dependent variable "perceived task-technology fitness" with the objective of finding the variables that determine what drives this assumption.

This study demonstrated that both co-worker contact and likelihood of

utilizing the technology if available directly influence the perception of fitness, especially the latter (see coefficient value in Figure 3i in *appendix i*). Another conclusion is that**, the negative value of the constant in the linear regression** (see constant value in figure 3i)**, demonstrates the importance of having co-worker contact and an existing will of using the technology in order to successfully evaluate the potential of the tool**.

One of the predictors found significant is related to the likelihood of the respondent to use the technology (tested by question 12), where 68% answer positively regarding intention to use the tool (including 19% stating it is highly likely they would use if given access to). In terms of sectors, *Media* stands out as having the highest percentage of employees stating to be likely for them to use (see Figure 4h in *appendix h*), but this result could be related with the fact that a large majority of employees is already using some sort of social technology in the workplace (see Section 2 - Table 3).

Backed by figure 30 and the relationship between the perceived fitness and its predictors, as well as the 94% of respondent's who affirm a relevant co-worker contact and a majority of respondents affirming intention to use the tool, **hypothesis 1: tasks from Portuguese employees are adjusted to the functionalities provided by enterprise social networks is validated.** In terms of sectors, in *Insurance* companies the contact with co-workers tends to be lower than other companies, arising the possibility that this hypothesis may not be valid; but considering that 60% of employees affirm they would use the tool if available, and being this the stronger predictor, the hypothesis remains valid for all sectors.

Concerning the benefits of social networks for the enterprise, employees in Portuguese companies believe that **an improvement of communication among team members, an increase of speed of accessing expertise knowledge, as well as an overall growth of this knowledge are the main advantages of having enterprise social networks in the company** (see figure

20). More than 50% of responders consecutively chose these advantages as key value points in the technology and all 3 options are related with communication, access to contents and speed of reaching expertise.

These same employees stated that they find the technology significantly easy to learn and utilize (according to figure 21). In terms of sectors, employees working in consulting and telecom tend to find the technology easier to learn (see figure 3g and 4g in *appendix g*), which is potentially correlated with age and usage of technology on a daily basis.

When questioned about which tasks employees perceived this technology to be useful, **the majority of proposed tasks received a positive evaluation regarding potentially usability of the tools**. These results follow the same line of answer from the likelihood of using the technology to fulfill these tasks, with 68% of respondents answering positively regarding the intention to use (see figure 23). Also connected to the last insight is that **the majority of employees in Portuguese companies require management promotion and support to adopt the technology in a daily basis**, as observed in Figure 24. In terms of sector, for *Media* employees it is more important this support from their managers than sectors such as *Consulting* or *Insurance* (see Section 2 - Table 8). This information could be related to variables such as team-size or decision-making capabilities per employee, but these are information's to be tested in future research.

The results presented above are directly linked with the second hypothesis from the employee functionality-fitness dimension, as showed in chapter III:

> *H2: Employees in Portuguese companies acknowledge the advantages and the functionalities of enterprise social networks and would use them if available in the workplace.*

H2 allows complement the partial answer offered by H1 to the second research question, in this case regarding to the knowledge, perceived functionality and advantages of social networks focused on business contexts.

Again, to study further the validation of the hypothesis, a second linear regression was run with the dependent variable "intention to use the tool".

The linear regression (see *appendix j*) demonstrated that the volume of co-worker contact and the volume of contact with external partners to the business directly influence the intention of an employee to use the technology, although the first negatively, the second positively and both with a weak impact (as observable by the coefficients in figure 3j). **The last predictor found significant is the perceived fitness of the technology by employees,** a variable tested and validated through hypothesis 1**. This variable also accounts for the majority of impact in calculating the likelihood of an employee utilizing the technology,** as observed by the respective coefficient in figure 3j.

This statistical test provides similar conclusions as the first regression, where companies with employees with high level of contact among them, as well as contact with the outside can benefit from utilizing these tools, and at the same time will potentially perceive it as fit to their tasks.

Supported by the demonstration of figure 31, where the connection of task characteristics, task-technology fit and perceived usefulness directly link to the intention to use, as well as the majority of respondents that affirm to have a significant volume of contact with external partners (64% as observed in figure 15) and the 61% of respondents that find the technology adequate to their job tasks (see figure 17) it could be possible to validate the second hypothesis, however it is necessary to observe that 94% of employees affirm to have a significant volume of contact with co-workers (see figure 14), and with a negative coefficient in the regression it could be an obstacle to validate the hypothesis. Nonetheless, since the stronger predictor is fitness to task, it is concluded that **hypothesis 2: Employees in Portuguese companies acknowledge the advantages and the functionalities of enterprise social networks and would use them if available in the workplace is valid.** In terms of sectors, *Telecom* employees have high levels of co-worker contact, but unlike

other sectors have a lower volume of contact with external partners. At the same time, *Telecom* and *Consulting* employees generally do not find enterprise social networks to have a high fitness level in relation to their tasks (see Figure 4f and 5f in *appendix f)*. Considering the coefficient relationship of these variables, it is questionable whether the hypothesis might not be valid to the *Telecom* and *Consulting* sectors.

Concluding, and considering the validation of the first and second hypothesis, it is possible to answer that the **employees on Portuguese companies are aware of the concept of social networks focused on the enterprise, a significant majority acknowledges most of its advantages towards improving their task performance and in general, employees find the tools fit and adequate to their task requirements.** It is important to highlight that, according to the research, for employees to find this technology fit, a significant volume of co-worker contact and willingness to use the technology must exist. It is also necessary to state that employees in *Telecom* and *Consulting*, although acknowledging the concept and advantages of social networks for companies, generally do not find this technology adequate to their daily tasks.

The third and last research question posed in the dissertation focused on understanding the management point of view of the technology, the relation between perceiving the advantages and its utility, and the likelihood of implementing or proposing the implementation in their company:

> *3. Is management aware of the advantages of this technology and is it willing to implement enterprise social networks within their companies?*

Concerning the advantages of enterprise social networks, managers from Portuguese companies find that communicating with their team, improving the connection and flow of contents between members of the team, increasing the quality of broadcasted messages and accessing work-related contents and features remotely are the key benefits of having access to the technology (see figure 26). The majority of presented benefits received over 30% of choice

among managers, indicating an overall positive answer regarding the existence of benefits from social networks for companies. Alongside with these results, the majority of managers in the targeted companies and sectors find the technology useful to perform management tasks, with 66% answering that they find either the tools useful or very useful (see figure 27).

Regarding the utilization of enterprise social networks in specific tasks of the core job, managers generally believe they would likely use the technology in some extent to perform each task (see figure 28). In their opinion, communicating internal information, offering market research and allowing fast access to expertise and knowledge workers are the most probable tasks where the technology would be promptly used.

Finally, concerning the likelihood of implementing the technology in the workplace and the impact of employee's opinion regarding the access of this technology, overall managers state that they will likely implement the technology, or, depending on their decision-making power regarding IT implementation, propose the adoption of the tools to their IT departments or superior managers (see figure 29). More than 70% of managers surveyed affirmed that they intend to have this technology available to their teams, including 13% of respondents stating that this is highly likely. When analyzing the same results, but now presenting a scenario where employees from their company expressed desire on having access to the technology, the majority of managers answering positively towards adopting the tools in the workplace grows to 83% (see figure 29).

The results previously presented are directly related with the third hypothesis in the management functionality-value dimension, as showed in chapter III:

> *H3: Managers at Portuguese companies are aware of the value of having enterprise social networks in the workplace and have plans to implement it in the future.*

H3 allows answer to the third research question, in this case regarding to the

knowledge, perceived advantages and willingness to implement social networks in companies by managers.

To study further the validation of the third hypothesis, a third linear regression was run with the dependent variable "intention to implement the tool", considered a variation of the segment "intention to use the tool2 from Dishaw and Strong's theory (1999).

The third linear regression (see *appendix k*) demonstrates the likelihood of utilizing the technology to perform its employee tasks and the knowledge that employees demonstrated desire to access the technology in the workplace directly impact the likelihood of a manager implementing the tools in the workplace. Although none of the variables have a strong impact, according to the study conducted they are the only factors that will determine the probability of implementation (see figure 3k for the coefficients).

Figure 32 shows the validated connections between the predictors and the dependent variable, based on Dishaw and Strong's model (1999). The perceived usefulness is considered as an influencer of the likelihood of implementation based on the second linear regression and its direct predictors (see figure 3j in *appendix j*). The attitude towards the use of the technology is also considered a direct influencer due to the impact of knowing the demand from employees.

Finally, considering that 68% of respondents have positively expressed intention to use the tool if available (and assuming the same distribution for employees with managerial responsibilities), the overall growth of intention to implement the technology considering a scenario where employees desire access to the tools (see figure 29), the major reduction of managers affirming that they would not implement the technology considering this new scenario and the increase by nearly 100% of managers stating they are highly likely to implement or propose implementation of enterprise social networks in their companies, in the future, it is possible to conclude that **hypothesis 3: Managers at Portuguese companies**

are aware of the value of having enterprise social networks in the workplace and have plans to implement it in the future is validated.

Concluding, and in this case considering the validation of the third hypothesis, it is possible to answer that the **management of Portuguese companies is aware of the concept of social networks for companies, understands the advantages of the technology and the majority is likely to implement or propose implementation,** however research shows that the existence of a grass root movement (Bughin, 2008), where **employees or direct reportees demonstrated desire and value of having access to the technology, would increase the likelihood of management to implement or propose implementation of the technology in the workplace.**

Considering the results presented in Chapter IV and the analysis conducted in Chapter V, it is possible to conclude that all the stakeholders involved in providing access of enterprise social networks in the workplace are aligned, the majority perceives the advantages of the features, generally employees and managers see a positive fit regarding improving their own tasks and what they can accomplish, and even demonstrate an intention to make the technology available or use it, if so.

Next, some limitations regarding this study are provided and research regarding profit-value and cost-benefit of having access to this technology is provided on the future research chapter.

5.3 Limitations

Some of the limitations on this study are related with the fact the complete enterprise social network technology is not available in the respondents of the online survey. Companies in each sector were selected based on the inexistence of Yammer or any other ESN package in their workplace. This fact indicates that the responders were answering based on their reactions if having this technology available, which sometimes tend to be more negative when compared to live-testing feedback.

A second limitation is the generalization of companies in each sector. The methodology for this dissertation did not study individual companies within selected sectors, and a further understanding of specific needs for each company could offer better results.

A limitation previously referred in Chapter IV is the fact that the study did not account for the roles of each employee and their specific task requirements. Although this information directly impacted on the answers to the survey (different employees in different roles answered), it is not possible to discriminate the relationship of different roles in the company with the perception of utility, fitness and likelihood of using the technology.

A complementary limitation is the fact that the study was fully completed via an online survey. Conducting interviews with live testing of Yammer could have offered better insights on utilization of features and more qualitative responses.

Finally, the last limitation is concerning the sample size, both in terms of answers per sectors, as well as overall number of sectors. Although the majority of sectors achieved a minimum of 30 different responders, a large set of answers would have provided more significant values for the conclusions. If the number of sectors analyzed was larger (in this study, 5 sectors were considered viable), this study could offer a more representative sample of the Portuguese economy.

5.4 Future Research

Beyond the conclusions and information provided by the study in this dissertation, there are other fields where future research could provide more answers. With companies such as Vitrue, Collective Intent and Involver being acquired by Oracle by more than $300 million, Buddy Media being purchased for nearly $700 million by Salesforce and Yammer being merged with Microsoft for $1.2 billion[16], large technology incumbents clearly understand the opportunity in business social networks and its push for globalization will be felt in the coming years.

It could be relevant in future research to analyze the perception of fitness and utility from employees who are currently using enterprise social networks in their companies. This research could be extended to the sectors analyzed in this study in order to compare the opinions before having access to social technology versus actual feedback of being exposed to the features of packages such as Yammer. Results from such study could support the reasons for large companies to find out what is the opinion of their own employees and what opportunities reside in deploying these services and products.

A potential topic of future research rose in the discussion of this dissertation, where the employee task-fitness linear regression (see section 5.3.1.1 from chapter V) found significant a predictor that is not considered directly connected in Dishaw and Strong's path structure (Davis, 1985, Goodhue & Thompson, 1995, Dishaw & Strong, 1999). Although this conclusion might only be true for this sample, if it was found significant in larger sample sets, it could lead to an expansion of the theory.

Another research opportunity, this time as complement to the study presented in this dissertation, is to deepen the questions surrounding the motivation of using technology in the workplace, the relationship between specific tasks and tools, the daily active utilization and churn rates of technologies present in the

[16] http://www.adexchanger.com/data-driven-thinking/70169/

workplace. Including these variables in the study could potentially improve the explanation percentages from the predictors found significant in this analysis (see R-squared values in Figure 1i, *appendix I*, Figure 1j, *appendix j* and Figure 1k, *appendix k*). In an optimistic scenario, it could offer new significant predictors, allowing managers and IT departments to use them in order to assess and convince employees of the utility and capabilities of using the tools on a daily basis.

A last future research to be considered is to find the drivers that companies who currently deploy enterprise social networks in their business used to assess and decide positively in adopting the technology. Studying factors such as cost-benefit, impact on customer service, rates of innovation from knowledge workers, general quality of communication across teams among other dimensions can potentially influence decision-makers in Portuguese enterprises to consider signing for a social network provider and migrate all employees into a connected system.

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VII. Exhibits

Index of Exhibits, Figures, Appendix and Tables

List of Exhibits

List of Tables

List of Figures

List of Appendices

7.1 Exhibit 1 - Survey questions

My name is André Albuquerque and I am a master of science in business administration candidate at Católica Lisbon School of Business and Economics. I am currently writing my master dissertation in the fields of strategic use of technology in Portuguese companies.

In order to support the results of my thesis, I am humbly asking you for your help to fill, anonymously, this survey. Answering this survey will not take longer than 10 minutes and it is of great importance to finalize my studies. If possible, I would ask you to answer in the most honest possible manner and to fill all questions.

I wish to appreciate for your help in advance,

*André Albuquerqu*e

Q1. Age

1	2	3	4	5	6
<21	22-29	30-44	45-54	55-64	>65

Q2. Gender

1	1
Male	Female

Page Break

This dissertation focuses on an enterprise technology named Yammer, a company owned by Microsoft. Yammer is an enterprise social network used within companies for private communication or extended group collaboration. Yammer works as a social network that is 100% focused on business and the

enterprise environment, guaranteeing full privacy and data protection due to access via your company domain and professional email.

Yammer allows you to:

- Have a private message inbox

- Have a real-time chat with your co-workers

- Have a feed to read and write announcements and broadcast messages and updates (eg: Facebook feed for companies)

- Store and add files, content and documents in a company library (Eg: Wikipedia for company contents)

- Search for knowledge and expertise across all employees

- Share files in real-time with your work peers

- Gather information and data about your performance

- Recognize your achievements of your peers or reports

Yammer is a social network inside your company that links with all existing technology you already use, with the design of consumer social networks (eg: Facebook, LinkedIn) but focused in helping you getting your job done.

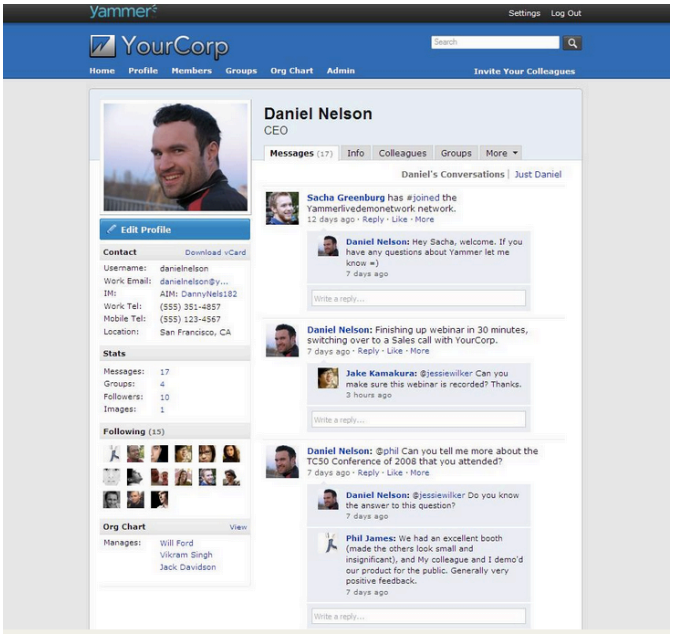


Figure a – Yammer's profile page

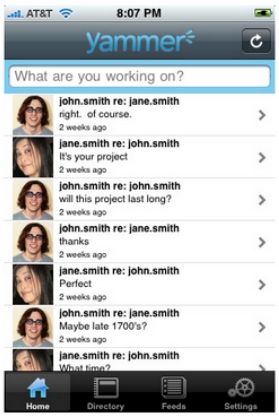


Figure b – Yammer Mobile interface

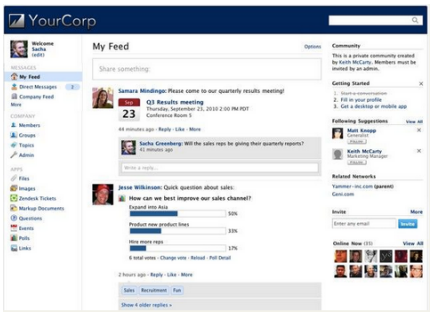


Figure c – Yammer activity feed

Page Break

Q 3 - How would you rate the volume of information (data), technology (tools) and access to expertise (knowledge) you require to perform your tasks?

1	2	3	4
Low volume	Some volume	Relevant volume	High volume

Q 4 - How often do you need to communicate with your co-workers on a daily basis in order to perform your tasks?

1	2	3	4
Low contact volume	Some contact volume	Relevant contact volume	High contact volume

Q 5 - How often do you communicate with external parties (suppliers, customers, partners) on a daily basis in order to perform your tasks?

1	2	3	4
Low contact	Some contact	Relevant contact	High contact

volume	volume	volume	volume

Q 6 - Taking into account the previous description of the technology Yammer and its functionalities, how would you rate the fit between the technology and the tasks you need to perform at work?

1	2	3	4
Low or no fit	Slight fit	Fit	High fit

Q 7 - Are you currently using any social networking technology in your workplace? For this question, please disregard any email client you might be using at work.

1	2	3
Yes	No	I am not sure

Q 8 - How would you rate your experience with social networking technology outside the workplace?

1	2	3	4
Low or no experience	Some experience	Relevant experience	High experience

Q9 - Considering your task requirements, please select, in your opinion, the top four advantages of enterprise social networks? Please rate assuming which advantages would be more important to impact your performance

Advantages
Increases innovation through open communication

Increases quality of messages and communication
Improves communication with external parties
Integrates with current systems used in companies
Improves quality of knowledge available
Improves speed of accessing knowledge
Improved the connection between co-workers and teams
Allows access to work contents in mobile platforms and remote locations
Increases productivity of work
Increases team engagement and quality of engagement

Q 10 - Considering your experience with social networks, how easy do you believe it would be to learn and use Yammer at work?

1	2	3	4
Difficult to learn and use	Somewhat difficult to learn and use	Somewhat easy to learn and use	Easy to learn and use

Q11 - Considering the description of the technology Yammer and its functionalities, for which tasks do you believe you would use Yammer? If any of the tasks described below are not part of your day-to-day job requirements, please select based on your probable reaction.

	1 – Not likely to use Yammer	2 – Maybe use Yammer	3 – Likely to use Yammer	4 – Very likely to use Yammer
Communicate with co-workers, team and management				
Communicate with external parties (suppliers, customers, partners)				
Access updated market information and research				
Access expertise and information needed to perform the job				
Write and add knowledge or contents for all the company				
Provide service support to customers, suppliers or partners				
Access detailed information about customers, suppliers or partners				
Track performance and analytic metrics				

Q 12 - Considering all the information previously described, how likely would it be for you to use Yammer to help you perform your tasks?

1	2	3	4
Not likely to use	Maybe would use	Likely to use	Highly likely to use

Q 13 - How relevant would be for top management to promote the usage of this technology, for you to adopt in your day-to-day activities?

1	2	3	4
Not important, would use if existing	Slightly important, but would probably use anyway	Important	Very important, would only use if management promoted

Q # – The next questions are only for managers. Are you a manager?

1	2
Yes	No

Q 14 - Considering your managerial task requirements, please select, in your opinion, the top four advantages of social networks in the workplace? Please rate assuming which advantages would be more important to impact your performance.

Advantages	**Label**
Increases communication with your team	Q21_1
Increases quality of messages and broadcasted information	Q21_2
Reduces costs of integrating communication technology with currently used technology	Q21_3
Improves the available contents of expertise knowledge	Q21_4
Increases speed of access to expertise	Q21_5
Improved the connection between co-workers	Q21_6
Increases team engagement and quality of engagement	Q21_7
Allows to communicate remotely and access corporate content	Q21_8
Increases productivity of team	Q21_9
Offers clear analytic data on employee performance	Q21_10

Q 15 - Considering the description of Yammer's features, the advantages of enterprise social networks and taking into account your managerial tasks, how would you evaluate the usefulness of having this technology available to manage your employees?

1	2	3	4
Not useful	Slightly useful	Useful	Very useful

Q 16 - Considering the description of the technology Yammer and its functionalities, for which tasks do you believe you would use Yammer? ? If any of the tasks described below are not part of your day-to-day job requirements, please select based on your probable reaction.

	1 – Not likely to use Yammer	2 – Maybe use Yammer	3 – Likely to use Yammer	4 – Very likely to use Yammer
Communicate with your team				
Manage team scheduling, targets and objectives				
Provide market information and research to your team				
Connect workers with expertise (eg: specialists) within your company with your team				
Access performance data on your team				
Manage and communicate corporate initiatives (eg: competitions) and information (eg: policies)				

Q 17 - Considering the described functionalities and advantages of enterprise social networks, how likely would it be for you to implement or propose the

implementation of this technology in your workplace to management or the IT department?

1	2	3	4
Not likely to implement or propose implementation	Slightly likely to implement or propose implementation	Likely to implement or propose implementation	Highly likely to implement or propose implementation

Q 18 - How likely would it be for you to implement this technology if employees demanded or asked for networking technology to exist in the office?

1	2	3	4
Not likely to implement or propose implementation	Slightly likely to implement or propose implementation	Likely to implement or propose implementation	Highly likely to implement or propose implementation

The survey is over. Thank you very much for answering my questions, allowing me to graduate. I would kindly ask you to "Submit" your answers in order to complete the survey.

Thank you

7.2 Exhibit 2 - Survey questions resume

#	Question
3	How would you rate the volume of information (data), technology (tools) and access to expertise (knowledge) you require to perform your tasks?
4	How often do you need to communicate with your co-workers on a daily basis in order to perform your tasks?
5	How often do you communicate with external parties (suppliers, customers, partners) on a daily basis in order to perform your tasks?
6	Taking into account the previous description of the technology Yammer and its functionalities, how would you rate the fit between the technology and the tasks you need to perform at work?
7	Are you currently using any social networking technology in your workplace? For this question, please disregard any email client you might be using at work.
8	How would you rate your experience with social networking technology outside the workplace?
9	Considering your task requirements, please select, in your opinion, the top four advantages of enterprise social networks? Please rate assuming which advantages would be more important to impact your performance
10	Considering your experience with social networks, how easy do you believe it would be to learn and use Yammer at work?
11	Considering the description of the technology Yammer and its functionalities, for which tasks do you believe you would use Yammer? If any of the tasks described below are not part of your day-to-day job requirements, please select based on your probable reaction.
12	Considering all the information previously described, how likely would it be for you to use Yammer to help you perform your tasks?
13	How relevant would be for top management to promote the usage of this technology, for you to adopt in your day-to-day activities?
14	Considering your managerial task requirements, please select, in your opinion, the top four advantages of social networks in the workplace? Please rate assuming which advantages would be more important to impact your performance.
15	Considering the description of Yammer's features, the advantages of enterprise social networks and taking into account your managerial tasks, how would you evaluate the usefulness of having this technology available to manage your employees?
16	Considering the description of the technology Yammer and its functionalities, for which tasks do you believe you would use Yammer? ? If any of the tasks described below are not part of your day-to-day job requirements, please select based on your probable reaction.
17	Considering the described functionalities and advantages of enterprise social networks, how likely would it be for you to implement or propose the implementation of this technology in your workplace to management or the IT department?
18	How likely would it be for you to implement this technology if employees demanded or asked for networking technology to exist in the office?

Exhibit 2 – Survey questions resume

7.3 Table – Section 1

Advantages
The scale of the architecture of participation, allowing any user to play an active role in creation of content available to the public.
Web design shift, empowering re-use and mix of data and techniques from multiple sources
Rich and responsive interfaces for consumers, adjusted both to the content provided as well as the experience intended.
Facilitation of content editing and modification.
Mashing up capabilities, both from a data point of view (using data from several databases) as well as an application point of view (mashing up API's from public applications to offer new experience or content).
Connection and communication across interest-based groups, resulting in active social networks.
Capacity to gather and organize collective intelligence, in order to provide valuable insights.

Table 1 – Advantages of Web 2.0

Table 2 – Advantages of Enterprise 2.0

Communication		
Open communication fosters innovation	Communication in social networks is constraints-free which allows participants to innovate	(Cook, 2008)
Increased quality in broadcasted messages	Not only the reach of users to broadcast messages increases, so does the platform where this information is posted, and the technology to follow and syndicate the release of new content	(Sitaram, 2010)
Increases security and compliance by employees	Communication from top to bottom employees, especially regarding corporate rules and policies, becomes more transparent	(Cisco Collaboration, 2010)
Open and customize communication with external parties	Communication with vendors, clients, suppliers and partners acquires a personal experience, improving relationships and information across participants	(van Zyl, 2009)
Costs		
Cost reduction due to infrastructure distribution	The cloud-based distribution of the software, as well as the updates and maintenance of social network software allowed companies to reduce their costs in this area.	Wood (2013)
Pre-integration with enterprise software systems	The capability of current enterprise social network solutions to pre-integrate with the enterprise software allowed to maintain transition costs low and to reduce them in the short/medium term	(Sitaram, 2010)
Knowledge and Information		
Crowd sourcing needs of knowledge among a larger pool of experts	The access to significant volume of employees with expertise in different areas it is possible to solve problems at faster rate. Search capabilities offer the possibility of tracking informal conversations	(Sitaram, 2010)
Easier access to information and content, especially via communication	The advanced sharing capabilities of communication allow faster access to information	(Sitaram, 2010)
Immediate connection with solutions and collaterals across the company	Employees across large companies generally work across different issues. When other employees work among similar issues, access to these contents reduces time and resources wasted	(van Zyl, 2009)
Optimizes team building	The improvement of the connection between knowledge workers and other employees optimizes internal relationships and results	(Cisco Collaboration, 2010)
Integration with infrastructure		
Integration of sensitive data protection systems	Enterprise social networks have embedded technology that protects sensitive data, allowing it to be freely shared internally	(Sitaram, 2010)
Design for mobile usage and integration through different devices	Enterprise social networks consider the mobility of workers	(Sitaram, 2010)
Team Management and Performance		
Constant monitoring of activities in the business context	Through real-time analytical technology, managers and employees has access to monitoring dashboard, offering valuable insights	(Udell, 2004)
Increases productivity by better assigning tasks	By understanding what needs to be done and communicating progress on tasks, productivity among teams is observed to increase	(Fauscette, 2012)
Accelerates team performance	Enterprise social networks and the technology existing in current solutions offer management analysis, transforming data in actionable information	(Cisco Collaboration, 2010)
Increases team engagement and quality of engagement	The services provided by enterprise social networks not only improve the quality of content shared through the platform but also the quantity and frequency	(Cisco Collaboration, 2010)
Productivity reduction	Adjusted real-time communication allows reducing breaks in productivity	(van Zyl, 2009)
Reputation database of employees	By organizing performance and achievements of employees, overall engagement increases	(van Zyl, 2009)

Table 4 – Advantages of Enterprise Social Networks

Advantages	Author
Loosen of hierarchical structure of companies since the decision-making process can be commented from the bottom level	Bughin (2007)
Boost an active participation from employees in all matters of the firm. Enterprise 2.0 accommodates rewarding and recognition for participation, motivating employees to collaborate and add value.	
Leveraging edge competencies rather than central competencies. Knowledge can now come from several sources, may them be internal or external, and participants are empowered to provide information in any field that can contribute to value creation.	
Lowering the costs of having a web-presence and harnessing intelligence from various sources	Grossman & McCarthy (2007)
Having the capacity to deploy a real-time collaboration technology that can reach at the same time employees, customers, partners or suppliers in a unified platform	
Have access to detailed analysis of all participants, a transparency of operations in the company and multi-directional active feedback	
Technology becomes easier to implement and maintain, due to its cloud distribution model	
High Performance Collaboration and Community Building - Enterprise 2.0 offers the tools for communication and collaboration to efficiently co-exist inside a company, resulting in improved performance.	Soriano et al (2007)
Collaborative Knowledge Emergence and Management - Enterprise 2.0 allows converging all knowledge spread across multiple channels into a unified network.	
Social Network Analysis and Business Intelligence - Social Network Analysis enables the company to track where its business intelligence is used, and who can add value to it.	
Business Process Management adapted - Enterprise 2.0 tools merge BPM and workflow systems in a unified platform that focuses on transforming the new knowledge into automation of business processes.	

7.4 Tables - section 2

Existance of Social Network	Media	Consulting	Telecom	Non Profit	Insurance	Overall
Yes	59%	30%	40%	19%	28%	34%
No	41%	67%	60%	71%	72%	62%
Not Sure	0%	3%	0%	10%	0%	3%

Table 5 - Existence of social network in the workplace by sectors

Volume of data, expertise and technology usage	Low volume	Some volume	Relevant volume	High volume
Media	0%	6%	47%	47%
Consulting	7%	20%	17%	57%
Telecom	3%	3%	43%	50%
Non Profit	10%	13%	52%	26%
Insurance	4%	8%	44%	44%
Overall	5%	10%	41%	45%

Table 6 – Volume of data, expertise and technology usage by sector

Volume of contact with co-workers	Low contact volume	Some contact volume	Relevant contact volume	High contact volume
Media	0%	3%	41%	56%
Consulting	3%	7%	43%	47%
Telecom	0%	13%	33%	53%
Non Profit	0%	0%	42%	58%
Insurance	0%	8%	64%	28%
Overall	1%	6%	43%	51%

Table 7 – Volume of contact with co-workers and team members by sector

Importance of management promotion and support	Not important, would use if existing	Slightly important, but would probably use anyway	Important	Very important, would only use if managemen t promoted
Media	3%	13%	72%	13%
Consulting	10%	27%	40%	23%
Telecom	7%	27%	30%	37%
Non Profit	7%	27%	30%	37%
Insurance	0%	40%	36%	24%
Overall	4%	24%	45%	27%

Table 8 – Importance of management promotion of the technology by sector

7.5 Appendices

Appendix a) – Descriptive statistics of sample

Finished

Frequency	Percent	Valid	Cumulative
157	100	100	100

Figure 1a – Total complete surveys

Age

		Frequency	Percent	Valid	Cumulative
Valid	1	4	2,5	2,5	2,5
	22-29	78	49,7	49,7	52,2
	30-44	48	30,6	30,6	82,8
	45-54	25	15,9	15,9	98,7
	55-64	2	1,3	1,3	100
	Total	157	100	100	

Figure 2a – Age distribution of total sample

Género

Frequency	Percent	Valid Percent	Cumulative Percent
71	45,2	45,2	45,2
86	54,8	54,8	100
157	100	100	

Figure 3a – Gender distribution of total sample

Are you a manager?

		Frequency	Percent	Valid	Cumulative
Valid	de uma equipa	40	25,5	25,5	25,5
	Não sou	117	74,5	74,5	100
	Total	157	100	100	

Figure 4a – Employee and manager distribution of total sample

Appendix b) - Age distribution by sector

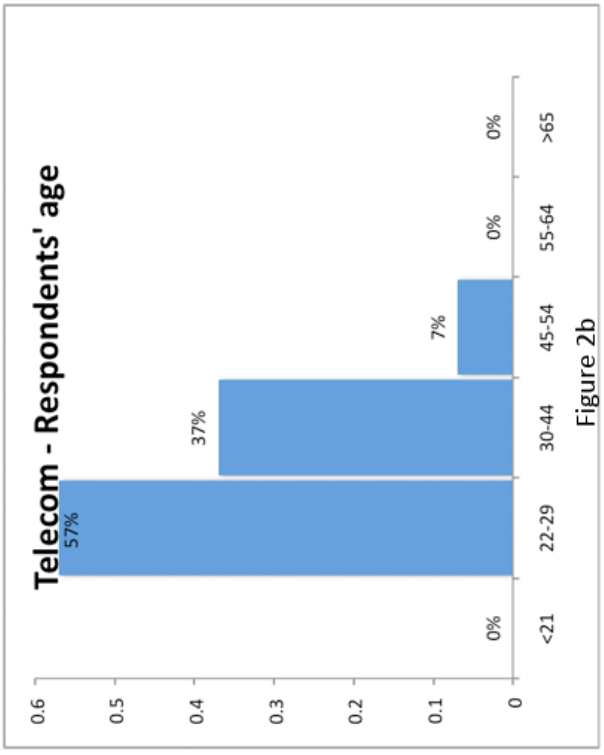


Figure 2b

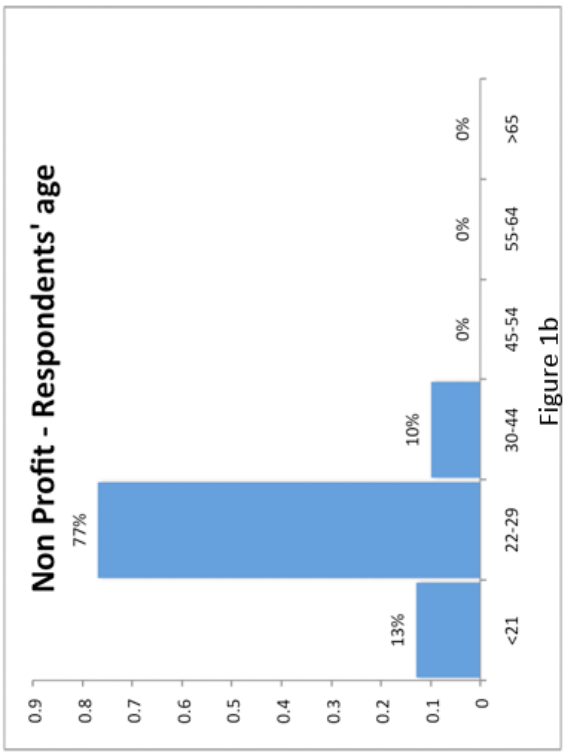


Figure 1b

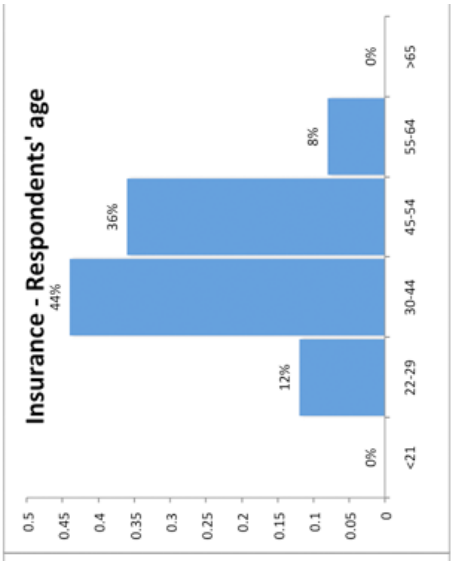


Figure 5b

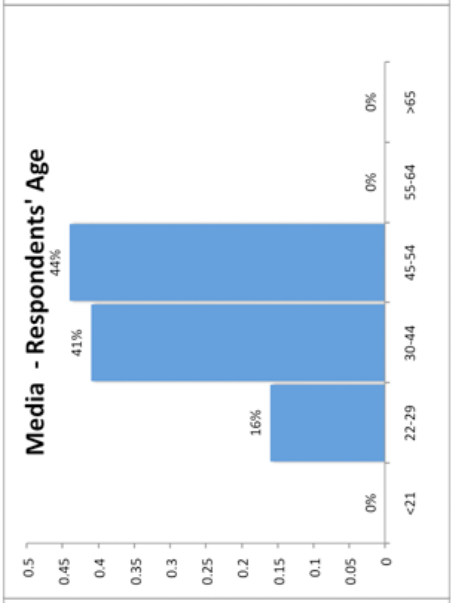


Figure 4b

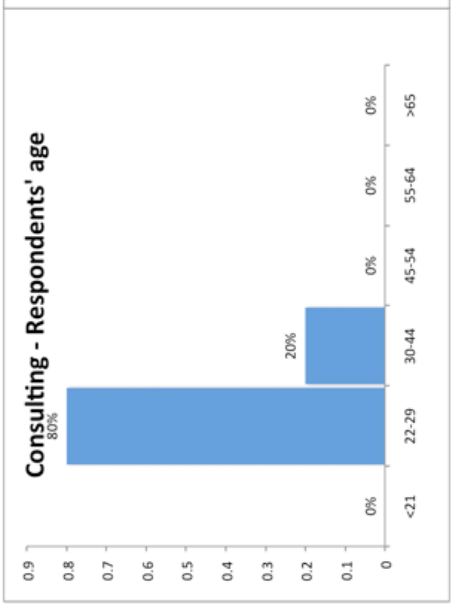
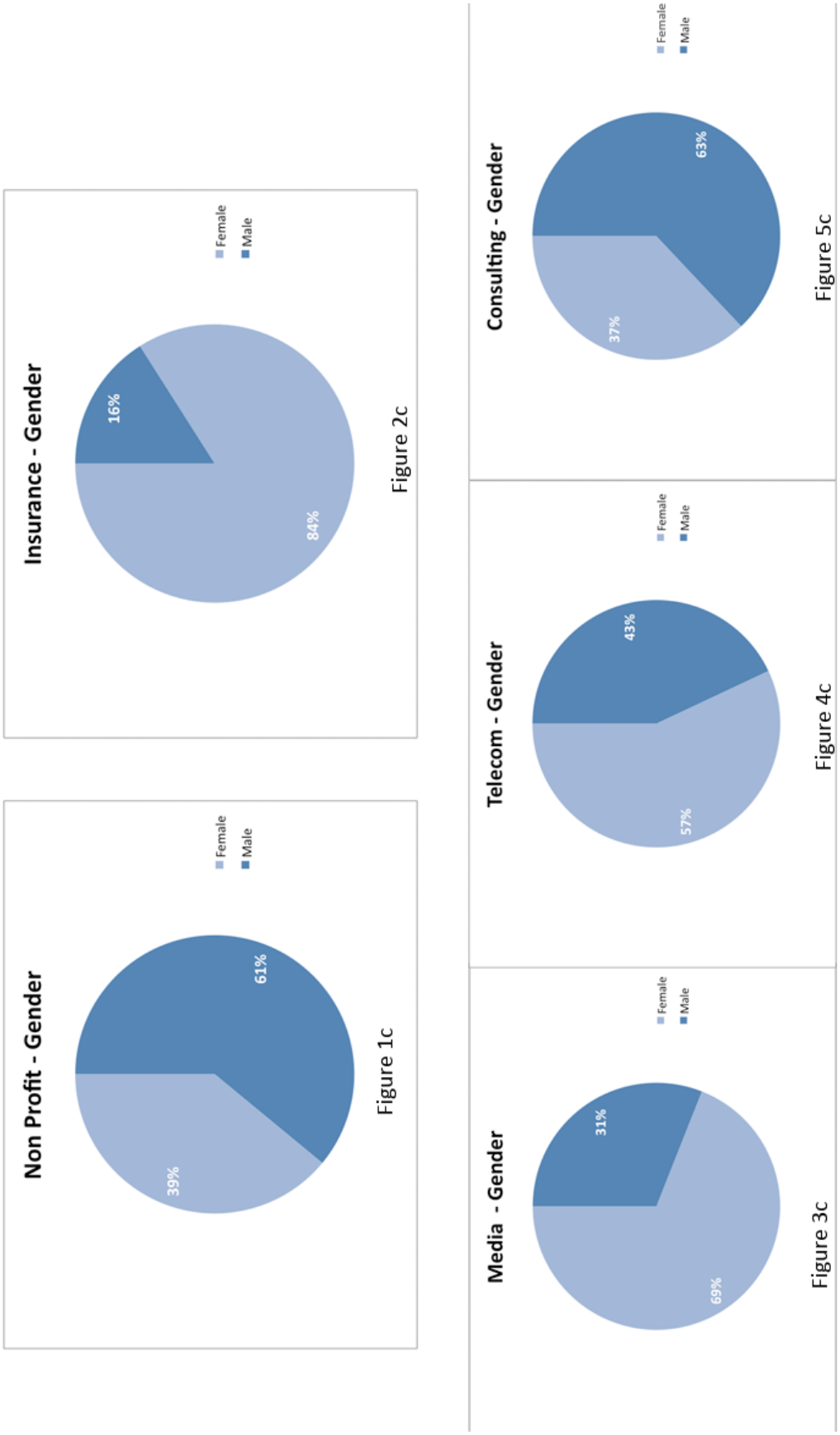
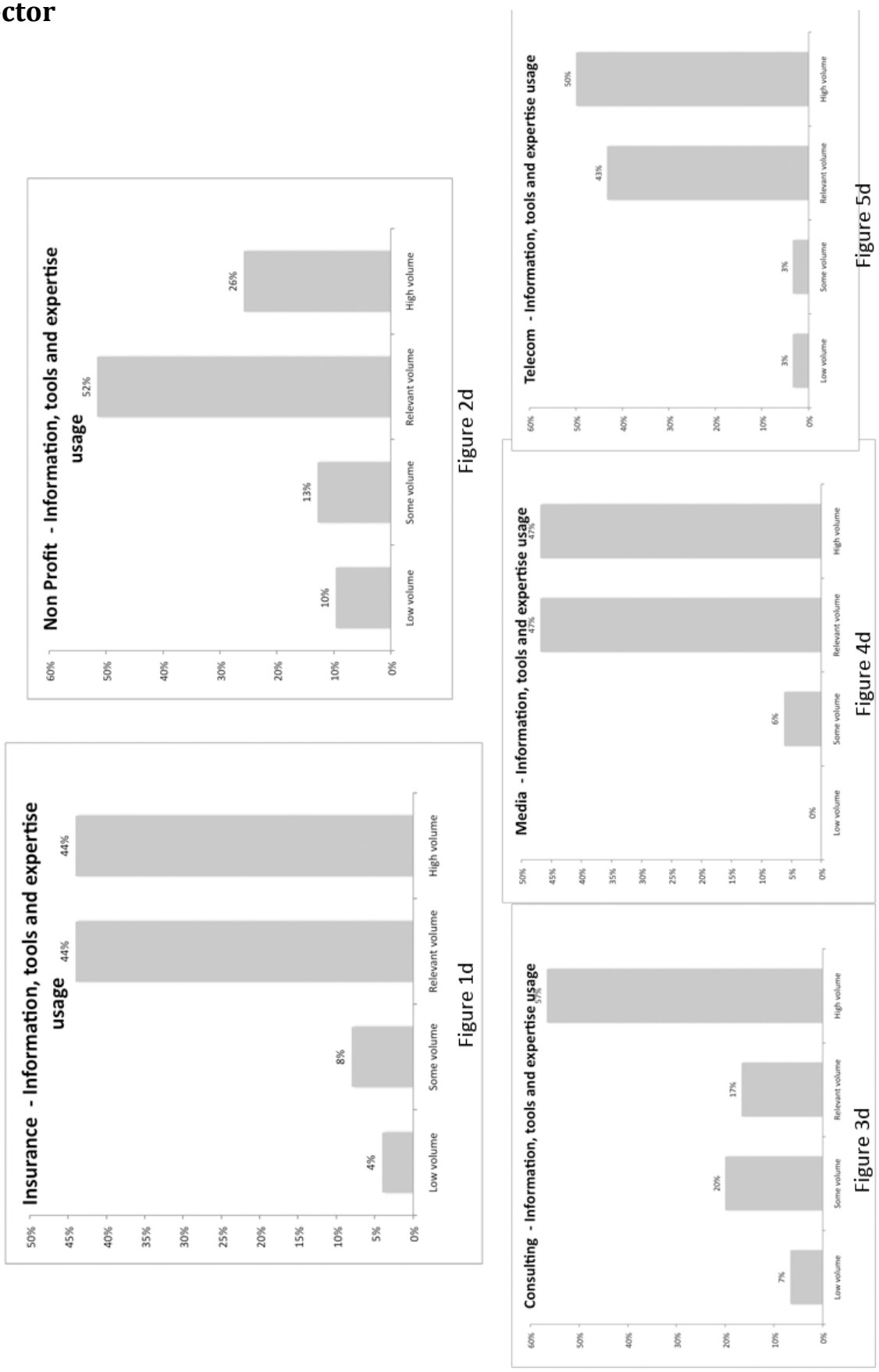


Figure 3b

Appendix c) – Gender distribution by sector



Appendix d) – Volume of usage of data, tools and expertise by sector



Appendix e) – Volume of contact with external partners by sector

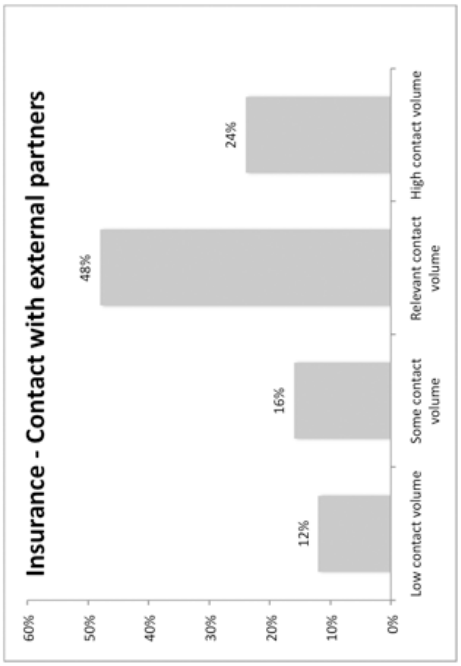


Figure 1e

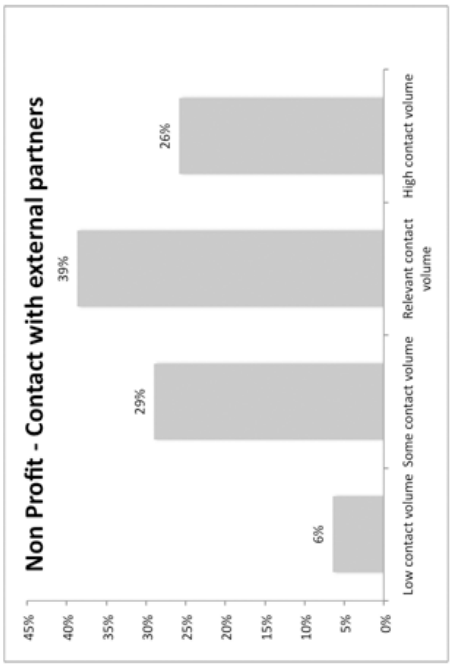


Figure 2e

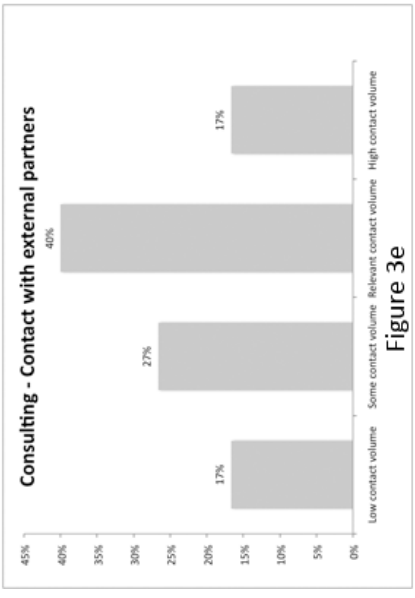


Figure 3e

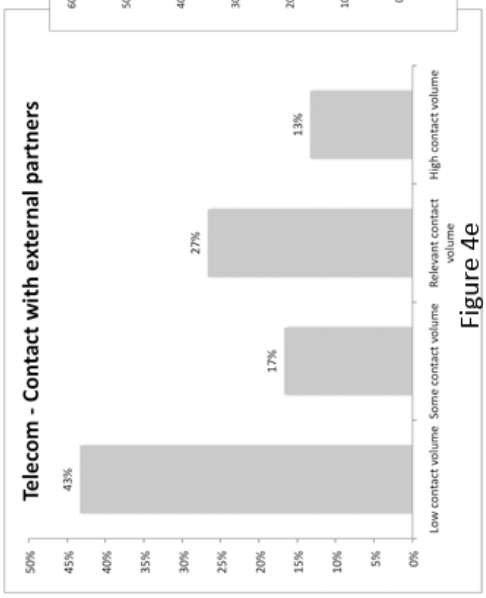


Figure 4e

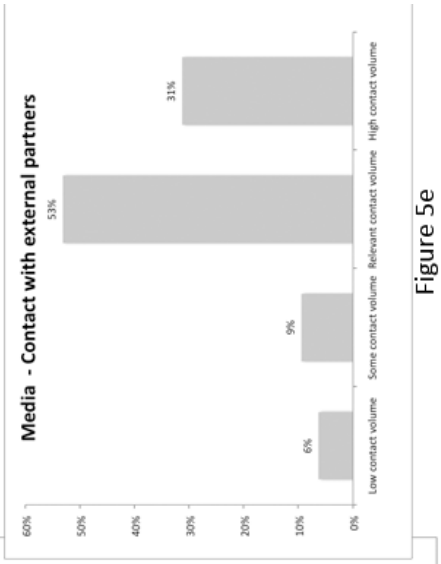


Figure 5e

Appendix f) – Perceived technology task fitness by sector

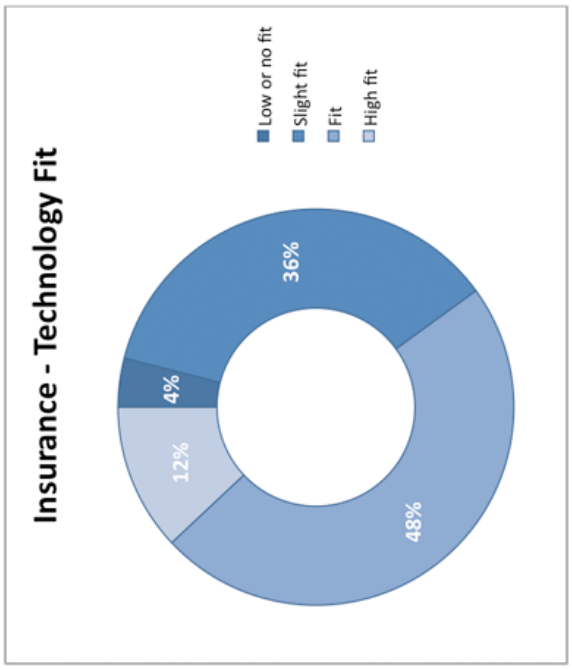


Figure 1f

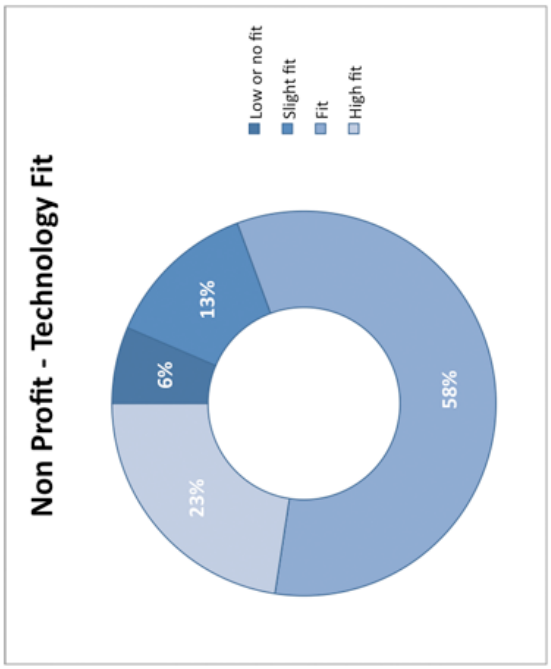


Figure 2f

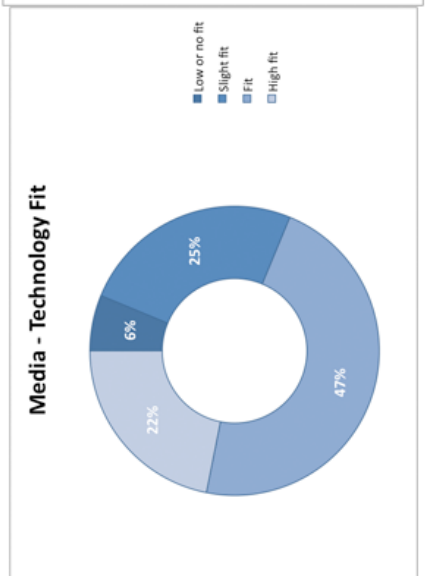


Figure 3f

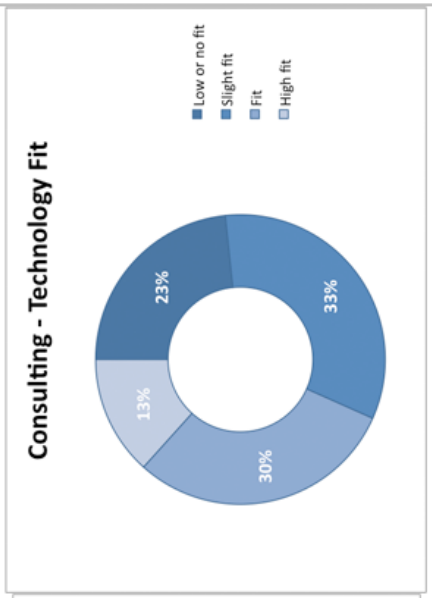


Figure 4f

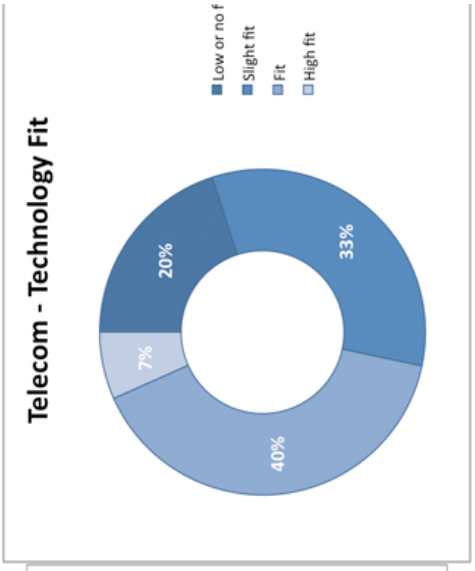


Figure 5f

Appendix g) – Easiness of learning the technology by sector

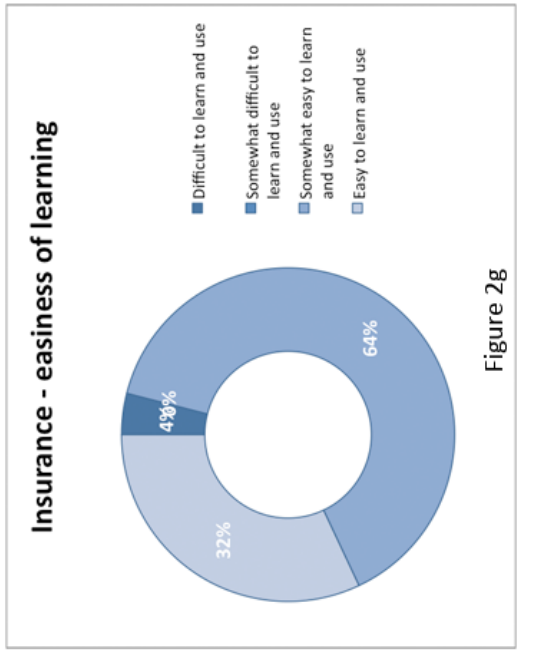


Figure 2g

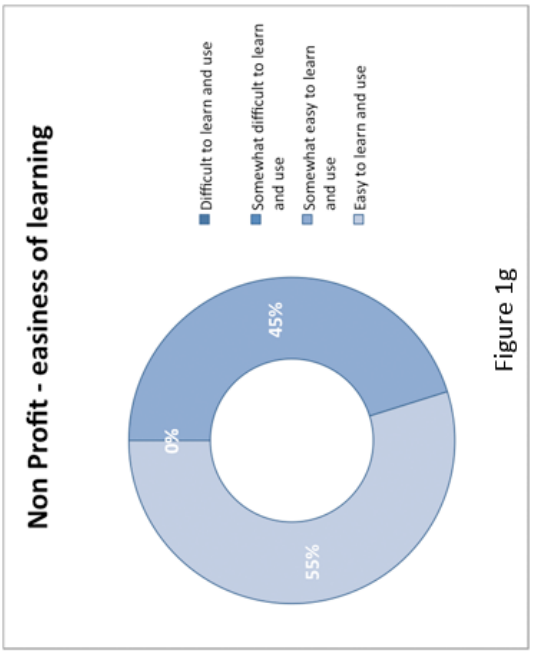


Figure 1g

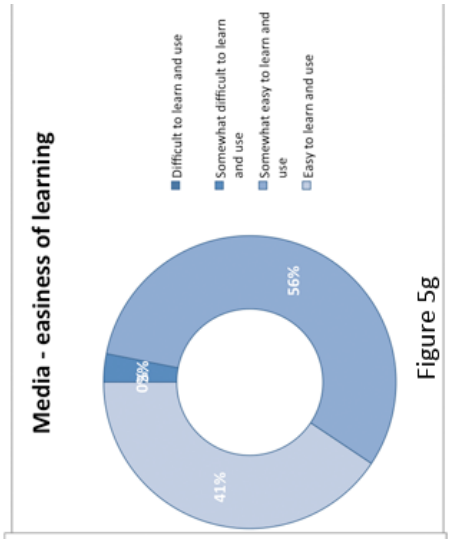


Figure 5g

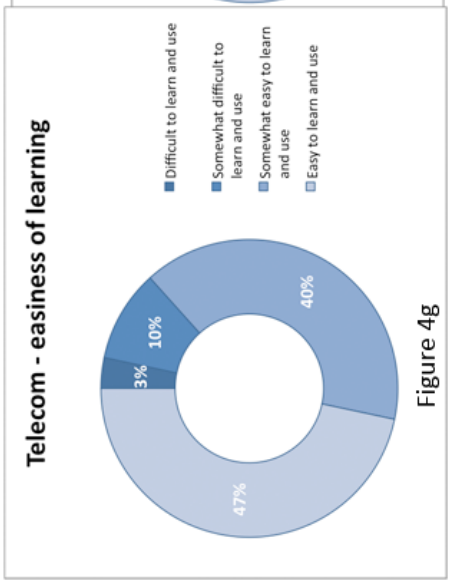


Figure 4g

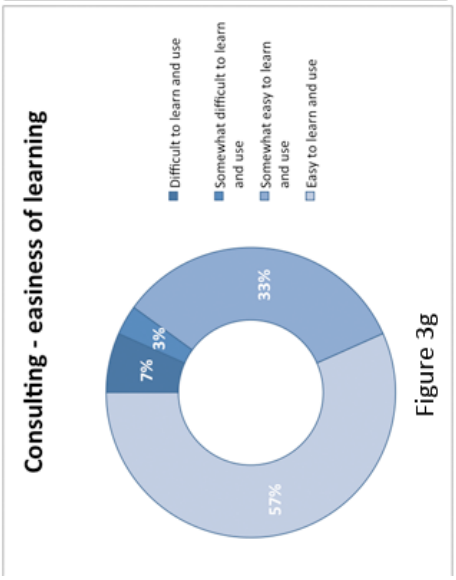


Figure 3g

Appendix h) – Likelihood of using enterprise social networks by sector

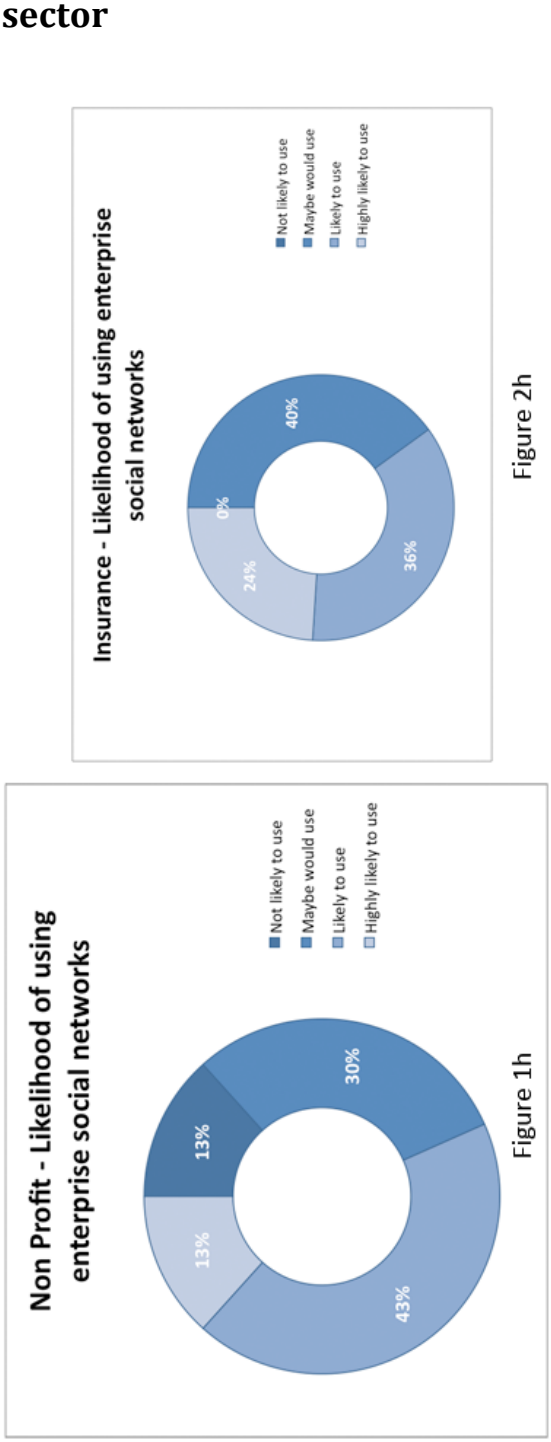


Figure 1h

Figure 2h

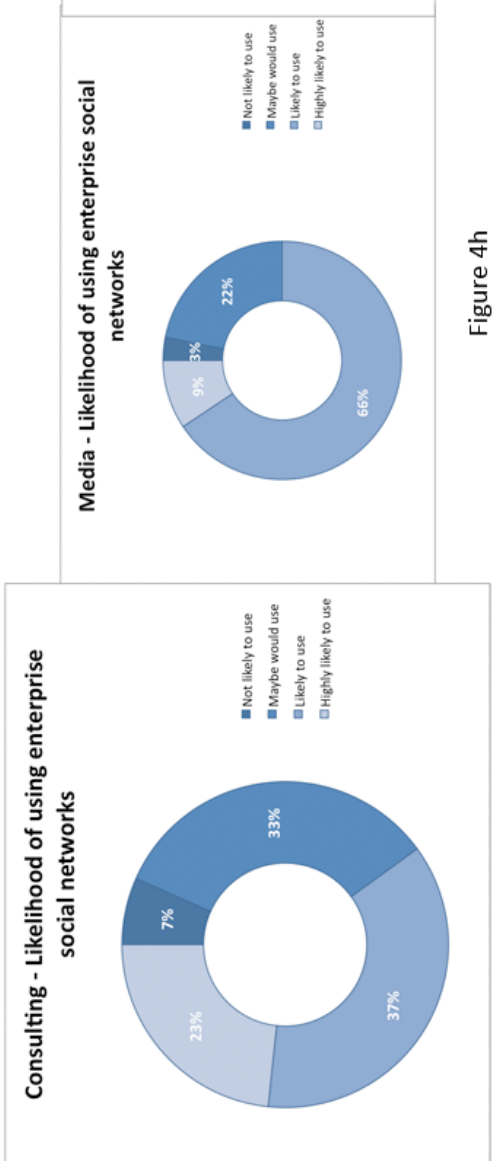


Figure 3h

Figure 4h

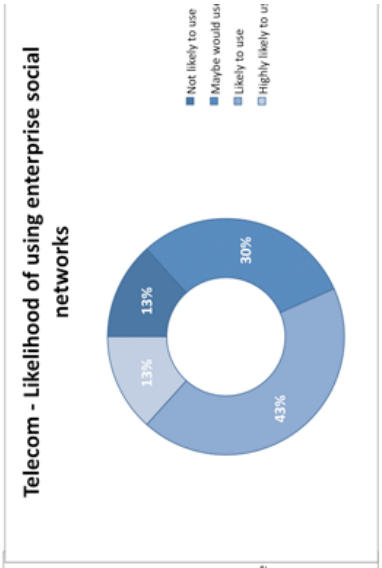


Figure 5h

Appendix i) - Employee task-fitness linear regression outputs

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,713[a]	0,508	0,478	0,657

Figure 1i – Model summary from employee task-fitness linear regression

ANOVA[a]					
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	65,379	9	7,264	16,844	,000[b]
	Residual	63,398	147	0,431		
	Total	128,777	156			

Figure 2i – ANOVA table from employee task-fitness linear regression

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
	(Constant)	-1,17	0,565		-2,071	0,04
	Age	0,07	0,076	0,063	0,912	0,363
	Utilization of data, tools and expertise in the workplace	-0,009	0,07	-0,008	-0,131	0,896
	Contact with co-workers	0,216	0,098	0,151	2,212	0,029
	Contact with external partners	0,013	0,06	0,014	0,216	0,829
	Existence of enterprise social network in the workplace	0,148	0,103	0,086	1,438	0,152
	Experience with social networks	0,007	0,078	0,007	0,09	0,929
	Easiness of learning Yammer	0,079	0,087	0,059	0,911	0,364
	Likelihood of using the technology in the workplace	0,747	0,074	0,647	10,132	0
	Importance of promotion of the technology by management	0,086	0,067	0,077	1,276	0,204

Figure 3i – Coefficient Table from employee from task-fitness linear regression

Appendix j) Employee functionality-fitness linear regression outputs

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,718[a]	0,516	0,486	0,563

Figure 1j – Model summary from employee functionality-fitness linear regression

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	49,69	9	5,521	17,391	,000[b]
	Residual	46,667	147	0,317		
	Total	96,357	156			

Figure 2j – ANOVA table from employee functionality-fitness linear regression

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
	(Constant)	1,455	0,477		3,052	0,003
	Age	-0,005	0,066	-0,005	-0,078	0,938
	Utilization of data, tools and expertise in the workplace	-0,001	0,06	-0,001	-0,015	0,988
	Contact with co-workers	-0,181	0,084	-0,146	-2,157	0,033
	Contact with external partners	0,141	0,05	0,181	2,802	0,006
	Task technology fitness	0,55	0,054	0,636	10,132	0
	Existence of enterprise social network in the workplace	-0,111	0,088	-0,075	-1,255	0,211
	Experience with social networks	0,085	0,067	0,093	1,268	0,207
	Easiness of learning Yammer	-0,034	0,075	-0,029	-0,46	0,646
	Importance of promotion of the technology by management	0,073	0,058	0,075	1,258	0,21

Figure 3j – Coefficient Table from employee task-fitness linear regression

Appendix – k) Management task-and-functionality-fitness linear regression outputs

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,898[a]	0,806	0,72	0,411

Figure 1k - Model summary from management task-and-functionality-fitness linear regression

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	18,949	12	1,579	9,368	,000[b]
	Residual	4,551	27	0,169		
	Total	23,5	39			

Figure 2k – ANOVA table from management task-and-functionality-fitness linear regression

Coefficients[a]					
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1,076	0,972		1,106	0,278
Age	0,059	0,112	0,063	0,528	0,602
Utilization of data, tools and expertise in the workplace	-0,15	0,106	-0,169	-1,417	0,168
Contact with co-workers	-0,12	0,171	-0,084	-0,701	0,49
Contact with external partners	-0,027	0,106	-0,029	-0,25	0,804
Existence of enterprise social network in the workplace	-0,211	0,147	-0,138	-1,435	0,163
Experience with social networks	-0,059	0,133	-0,055	-0,441	0,663
Easiness of learning Yammer	0,097	0,18	0,063	0,539	0,594
Likelihood of using the technology in the workplace	0,37	0,153	0,386	2,414	0,023
Importance of promotion of the technology by management	-0,077	0,098	-0,08	-0,788	0,437
Utility in a manager's perspective	0,091	0,14	0,107	0,65	0,521
Impact of employee's desire for access to the technology	0,415	0,125	0,41	3,318	0,003

Figure 3k – Coefficient table from management task-and-functionality-fitness linear regression