Implementation of Learning Platforms

The influence of dilemmas in the adoption of Learning Platforms

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by

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Summary

In our knowledge society, the learning and development of the workforce is key to drive organizational performance (Falconer, 2006). Companies are acknowledging that people learn all the time, everywhere, from their peers and their own experiences (ASTD, 2008), which means that focusing in the management and delivery of training is not enough anymore (Bezhovski & Poorani, 2016). Digital technologies reshape business models and organizational structures (Phillips, Yu, Hameed, & el Akhdary, 2017). In learning, digital technologies have been traditionaly used for the creation and distribution and formal learning, but now the technologies used to support workplace learning are evolving to acommodate learning beyond formal trainings, going from a content-centric to a learner-centric approach (Phillips et al., 2017).

Organizational learning and knowledge management have been strong streams of research for decades. However, the studies with a technological perspective are sparse. On the other extreme, research on information technologies has long been interested in the factors that influence their adoption, but when looking at e-Learning it has not incorporated the insight from OL research. Meanwhile, companies face many challenges when introducing a learning platform, and ofter shortly after its introduction, the platform goes unused. This research tries to shrink this knowledge gap by enabling a better understanding of the factors that foster and hinder the adoption of learning platforms in companies.

Research aim: Achieve a better understanding of why learning

platforms go unused after introduction.

The hypothesis of this study is that beyond the factors that influence the adoption of learning platforms, the tensions that emerge during the introduction of the learning platform are of key importance to the success or failure of the project. When a company tries to control the factors to ensure a successful introduction, tensions will emerge, trade-offs will need to be done, which will be of critical importance to the eventual adoption of the platform by its users. Beyond identifying which dilemmas emerge, it is important to understand how can these dilemmas be reconciled, how should the decision making process be carried out to solve the emerging dilemmas. To reach the research objectives, the following research question was answered:

How does the reconciliation of the underlying dilemmas in the introduction of a learning platform influence its adoption?

Initially, a review of the relevant literature was performed to analyze which factors had studied to influence the adoption of learning platforms (Chapter 3). The outcome of the literature review was a conceptual model, structured in 3 dimensions: Content, Social, and Technical. A fourth dimension comprehended the dilemmas between the factors of the model (Figure 3.3). After formalizing the insights into the model, an exploratory case study was performed at a company. 20 semi-structured interviews were conducted with L&D professionals and future users of a learning platform being introduced. The information from the interviews was then coded to perform a content analysis. The content analysis used the factors included in the model from Chapter 3 as codes. When the content of the interviews did not belong to any factor previously included in the model, additional codes were developed. The confrontation of the original model with the insight from the case lead to an updated version of the model (Figure 6.3).

Further, the exploratory case study resulted in the identification of the dilemmas in the implementation of a learning platform. Following the dilemma reconciliation method, the dilemmas were first identified, then the two extremes of the dilemmas were pinpointed and finally dilemma-positioning was used to reconcile the dilemma and achieve a win-win outcome. The reconciliation of the dilemmas resulted in the identification of 9 recommendations:

- Intra-factor dilemmas:
  - **Community management:** To enable community management to positively affect the adoption of a learning platform, a company needs to reconcile the dilemma between top-down and bottom-up community management.
  - **Individual characteristics:** To reconcile the expectations of different user groups, a company needs to tap into different sources of engagement.
  - **Platform quality:** Seeking to introduce a Minimum Viable Product will foster the reconciliation of a company's quality dilemma regarding the introduction of a learning platform.
  - **Content quality:** To ensure quality of content, a company will need to reconcile the need for up-to-date content and rich content, focusing on maximizing relevance.
  - **Content Scope:** Clearly articulating the goal of the content to be created contributes to a successful definition of the content scope.
- Inter-factor, Intra-dimension dilemmas:
  - **Platform complexity and platform flexibility:** The use of a modular design will allow a learning platform to reconcile complexity and flexibility, positively influencing the adoption of the learning platform.

  - **Platform complexity and IT Ecosystem:** By ensuring that all the tools within the IT ecosystem of a company are adopted and fulfilling their aim, the complexity of the learning platform can be reduced.
  - **Content creation strategy and content quality:** To ensure that the content creation strategy used will not negatively impact content quality, a strong validation processes need to be set in place.
  - **Content flexibility and content quality:** By taking an agile approach to content creation, companies can ensure that content flexibility and quality are balanced.

- Inter-factor, Intra-dimension dilemmas:

  - **Individual characteristics and content scope:** When the user base of the learning platform is highly heterogeneous, a company will have to delimit which profile of user to focus on in terms of content available.
  - **Supported ways of learning and platform complexity:** Companies can reconcile the need for extensive features with the need to reduce the platform's complexity by adopting user-friendly design.
  - **Platform complexity and individual characteristics:** Users' training to use the platform, and user-friendly design will allow a company to reconcile the need for certain platform complexity with the need of a platform that can be used by users with different technology savviness.

Great challenges surround the introduction of learning platforms. Analyzing the social, technical and content factors that will influence adoption will contribute to a more successful introduction of the learning platform. Explicitly addressing the dilemmas that emerge in their introduction can transform unsolvable trade-offs in innovative solutions that accommodate alternatives that seemed incompatible.

Contents

List of Figures

List of Tables

Abbreviations

General

ESN	Enterprise Social Network
IS	Information System
IT	Information Technology
KM	Knowledge Management
L&D	Learning and Development
LMS	Learning Management System
OL	Organizational Learning
TAM	Technology Acceptance Model
UTAUT	Unified Theory of Acceptance and Use of Technology

Hilti-specific

AM	Account Manager
ASM	Area Sales Manager
MO	Market Organization
PE	Pricing Expert
A1	North Asia
A2	South Asia
E1	Northern Europe
E2	Western Europe
E3	Central Europe
E4	Southern Europe
EE	Eastern Europe
META	Middle East, Turkey & Africa
W1	North America
W2	Latin America

1 Introduction

1.1. Problem Statement

We live in a knowledge society, where knowledge work has become the driver for economic growth (Neef, 1998), and digital technologies are reshaping business models and organizational structures (Phillips et al., 2017). Organizations are actively seeking to nurture, manage, and harvest their knowledge assets (Conceição, Gibson, Heitor, & Sirilli, 2001), and Information Technologies (IT) are enabling this transformation to happen at a pace never seen before (Masuda, 1980).

For the learning and development of their workforce, companies are increasingly relying in IT. Among the main reasons, its cost-effectiveness and flexibility (Noe, Clarke, & Klein, 2014). Learning in the workplace does not occur only through formal learning, but also by learning from others and learning from one's own experience (Arets, Jennings, & Heijnen, 2015). Past IT systems for learning have taken the approach of knowledge as a possession, developing knowledge repositories and learning management systems (Venkitachalam & Busch, 2012), that focused on formal training. Critics to this narrow view of learning have favored the appearance of learning platforms that support other

means of learning. The addition of web 2.0 features that enable social interaction facilitates social learning, and semantic web features such as intelligent search engines are now being introduced to facilitate learning the right thing at the right time (Shawky, Shaltout, & Bin-Salamah, 2013; Ohler, 2008).

While the need for learning and development goes beyond doubt, there is a problem which persists. According to a study by CEB (now Gartner), 66% of business leaders do not think that Learning and Development (L&D) impacts business outcomes, and 77% think that L&D is not timely in addressing business challenges [1]. In their study of the current state of employee training, West UC's Digital Media Services found that more than a third of their respondents (full-time employees) felt their current training programs were not a productive use of time [2]. Finally, while half of the respondents said in-person training was effective, this rate dropped to 41% for interactive on-line courses. Meanwhile, the investment in learning and development keeps growing, and becoming increasingly digital [3].

Technologies aimed at supporting learning in the workplace are ubiquitous nowadays, but after implementation, these technologies go often unused. Many factors have been argued to influence the success of implementation of information technologies in the workplace, either in general (Venkatesh, Morris, Davis, & Davis, 2003) of focusing in learning (Miranda, Isaias, Costa, & Pifano, 2017). It is accepted that the factors that affect adoption of these technologies are not merely technical, and social factors such as organizational support play an equally important role (Pei-Yee-Chin, Evans, Kim-Kwang-Choo, & Tan, 2015). When focusing in technologies for learning in the workplace, factors related to the content play also a critical role (Miranda, Isaias, Costa, & Pifano, 2016). Still, there is a gap between the understanding of the factors that influence adoption and

[1] CEB (2016). *L&D Takes On: Making Your Learning Investments Count*
[2] West UC (2015) *State of Employee Training*
[3] atd (2015) *State of the industry*

providing actionable recommendations.

There is an understanding of the underlying factors, but no agreement on how to ensure a successful implementation. This lack of agreement can be caused by the emergence of tensions in the introduction of a learning platform in a company. When introducing a learning platform, key decisions need to be made. For instance, while it is uncontested that perceived usefulness will positively impact the adoption of the platform, the literature does not give recommendations on what to do if two conflicting options seem to increase the perceived usefulness: A high degree of flexibility increases the chances of the platform being perceived as useful by the user (Miranda et al., 2017), but at the same time in increases complexity, which is detrimental to user intention of adoption (Miranda et al., 2017). They are equally valuable extremes, so an "either-or" approach will prove unsuccessful (Kuoppakangas, 2013).

Dilemma-reconciliation was introduced as a methodology to facilitate conscious decision making around dilemmas (Laine & Kuoppakangas, 2015). By identifying the underlying polarities, dilemma-reconciliation method dives into a logic of resolution in which both contrasting premises are reconciled to create synergy. In the organizational context, the focus is not in insoluble paradox, but in "practical dilemmas" that have the potential to create synergies when the contradictory values are properly reconciled (Hampdem-Turner & Trompenaars, 2000).

1.2. Managerial and Scientific Relevance

If the dilemmas in the introduction of learning platforms are not properly reconciled, there is the risk of making unconscious trade-offs that lead to an unsuccessful introduction. Even if the factors that influence adoption are well understood, putting insufficient attention into the trade-offs that need to be made can hamper the introduction of the learning platform critically. When a learning platform goes unused, is not only a waste of the

resources dedicated to its introduction, such as money or time, but also a threat to the sustainable competitive advantage of the company, that fails to manage its knowledge assets (Conceição et al., 2001). Without identifying the underlying dilemmas, practice can be aware of the factors that research has pointed out as critical for adoption, but it becomes difficult to make sound decisions in the real-life setting.

Research has been striving to better understand what influences the adoption of information technologies in companies. The Unified Theory of Acceptance and Use of Technology (UTAUT), as developed by Venkatesh et al. (2003) identified social influence, performance expectancy, effort expectancy and facilitating conditions as key to predict the usage of a technology. Efforts have also been made to better understand these factors when focusing in technologies that support learning. Contributions have been made from several fields; including Information Systems (IS), Knowledge Management (KM), or Organizational Learning (OL). A lack of integration between the research from these fields opens an important research gap in the understanding of the introduction of learning platforms. Moreover, enriching the existing literature regarding adoption of learning platforms with the identification of the underlying dilemmas can strengthen the existing theory. Instead of considering the influencing factors the end-point of theory, great insight can be provided by the acknowledgement that the trade-offs between and within factors have an important weight, and that most likely, excellence in all factors cannot be achieved due to the existence of dilemmas.

1.3. Research Motivation

There is a need for integrating what has been researched about learning in the workplace with the research regarding adoption of information technologies. Such an integration, combined with an analysis of the tensions that emerge between and within factors, can advance the understanding of how can a company support the introduc-

tion of a learning platform for its employees. The aim of this thesis is to fulfill the need described. In order to do so, this thesis will aim to answer the following question:

> *How does the reconciliation of the underlying dilemmas in the introduction of a learning platform influence its adoption?*

The answer to this question requires two big blocks of research. First, a clear understanding of the factors that influence the adoption of a learning platform is needed. Then, the dilemmas between factors need to be examined. For the first block, the existing literature lays the groundwork. This field has been amply researched, and synthesis and integration of previous research can provide great insight. The second block is instead more exploratory, with little previous research. A more exploratory approach needs to be taken, in order to get a first contact with the underlying dilemmas in the introduction of a learning platform, and provide a basis for deeper analysis.

1.4. Thesis Outline

To carry out the study, this thesis is structured as follows. After the introduction, the research methodology is introduced in Chapter 2. The research questions are introduced and the research approach is presented. Divided into two phases, the research approach consists in a conceptual and an empirical phase. In the conceptual phase, a literature review provides the knowledge background to propose a model of the factors that influence the adoption of a learning platform. In the empirical analysis, an exploratory case study is conducted at a company, to test the model developed in the first phase and explore the use of the dilemma-reconciliation method in a real setting. Chapter 2 concludes by discussing the research methods and tools used.

In Chapter 3, a literature review examines the existing body of knowledge relevant to the thesis. Starting from the challenges that workplace learning is facing, the use of technology for learning and development is introduced. The literature regarding the

adoption of technologies in the workplace is reviewed, starting by the UTAUT and then deepening in research that has focused in the adoption of technologies for learning. The background acquired is then complemented with an overview of the dilemma theory and the reconciliation methodology. The outcome of the chapter is a model that presents the factors that are hypothesized to influence the introduction of a learning platform, including the presence of underlying dilemmas between these factors.

Chapter 4 provides the background information about the case company, Hilti AG. Chapter 5 presents the exploratory case study that has been conducted for this thesis. The study takes place at a manufacturing company that recently introduced a new learning platform to its workforce, and focuses on the introduction of this platform for its employees who are part of the pricing team. Before the introduction of the learning platform, interviews are done to pricing experts and learning and development professionals. The results of these interviews are presented in this chapter. Chapter 6 discusses the results obtained in Chapter 5, linking them to the model developed in Chapter 3. Chapter 7 follows with the conclusions and recommendations. It reflects on the research questions of the study, and finishes with potential limitations, reflections on the work, and suggestions for future research.

2

Research Methodology

2.1. Research Aim

The aim of this thesis is to contribute to the body of knowledge regarding why learning platforms go unused after introduction. This thesis aims to do so by analyzing which factors influence the success of the implementation of learning platforms, and how the tensions that emerge between these factors play a role.

From the aim of the research, two big blocks can be identified, a first block of a theoretical nature, and a second block more empirical. The two-fold nature of the research aim guides the structure of the thesis. The literature review contributes mainly to the analysis of the factors that influence the adoption of a learning platform. Then, the case study explores the role of dilemmas and their resolution in a real setting.

2.2. Research Question and Sub-Questions

As stated in Chapter 1, the research question is the following:

> *How does the reconciliation of the underlying dilemmas in the introduction of a learning platform influence its adoption?*

It is noted that the scope of the research is delimited to include businesses, excluding academia. Higher education is a setting in which technologies to support learning have been thoroughly studied and there is a lot of information available. However, this research aims to understand adoption of learning platforms in companies, and thus it needs to look beyond research focused in higher education.

The hypothesis of this study is that, beyond the factors that influence the adoption of learning platforms, the tensions that emerge during the introduction of the learning platform are of key importance to the success or failure of the project. The understanding of the key factors is critical, but it may not be sufficient to support a successful introduction. When a company tries to control the factors to ensure a successful introduction, tensions will emerge, trade-offs will need to be done, that will be of critical importance to the eventual adoption of the platform by its users. Beyond understanding which dilemmas emerge, it is important to understand how can these dilemmas be reconciled, how should the decision making process be carried out to solve the emerging dilemmas.

To facilitate answering to the main research questions, the following sub research questions are formulated:

1. Which factors influence the adoption of a learning platform in a company?

2. Which dilemmas emerge in the introduction of a learning platform?

3. How can the dilemmas be reconciled in the introduction of a learning platform?

2.3. Research Approach

This thesis is structured in two phases. The first phase focuses in the first research sub question, while the second focuses in sub questions 2 and 3. In this section, the two phases are described as well as the approach for each phase.

2.3.1. Phase 1 - Conceptual Phase

Firstly, a review of the existing literature on adoption of learning platforms is performed as a necessary step to develop the theoretical foundation for the research. Two streams of research contribute to the body of knowledge about learning platforms, and both are studied. The first stream involves learning in the workplace, and has contributions from the fields of knowledge management and organizational knowledge. The second stream focuses on the factors that influence the adoption of learning platforms. The research about learning platforms in companies is scarce, and thus the review follows a path from generic information systems, to specific research about technologies that support learning.

Secondly, the aim of this research is to complement the understanding of the critical factors with the identification of the key dilemmas between them. At the conceptual phase, a review is done of the literature regarding dilemma theory. Because the aim is to facilitate the decision-making during the introduction of a learning platform through a better understanding of the tensions that emerge, the focus of the literature review is the contribution of dilemma theory to change management.

At the end of this phase a model is proposed for the study of the adoption of learning platforms. The model integrates and synthesizes the research reviewed throughout the phase, and contributes to the answer of the first research sub question. Phase 1 is covered in Chapter 3, and the model proposed is tested in a real setting in Chapter 5.

2.3.2. Phase 2 - Empirical Analysis

The model developed in Phase 1 lays the ground for deepening the understanding of the influence that dilemmas have in the adoption of learning platforms. In order to do so, the approach chosen is to conduct an exploratory case study at a company which

introduced a learning platform to its workforce. Having direct access to the experience of a company in the introduction of a learning platform was an opportunity to test the results from the conceptual phase in a real setting, and enrich the contributions of this thesis with practical insight.

According to (Yin, 1980), three factors are important to choose a research approach: Type of research question, extent of control that the researcher has, and whether the research focuses on contemporary or historical events. Moreover, whether a study is exploratory, descriptive, or hypothesis testing depends on the stage to which knowledge about the research topic finds itself. In an exploratory study, the aim is to explore new areas of organizational research, while a descriptive study tries to describe certain characteristics of a phenomena already studied, and a hypothesis-testing study examines conjectural relationships within the phenomena of interest (Sekeran & Bougie, 2013). Exploratory studies are also necessary when some facts are known, but more information is needed for developing a viable theoretical framework (Sekeran & Bougie, 2013). Therefore, an exploratory case study was the approach that best fitted the needs of the study.

Often, case studies have been deemed to lack rigor and generalizability (Flipp, 2014; Harrison, Birks, Franklin, & Mills, 2017; Yin, 1980). The flexibility of case studies allows for fundamental biases and excessive subjectivity, but following a clear structure and reflecting often on the rigor of the case can overcome these challenges (Rosenberg & Yates, 2007).

2.4. Research Methods and Tools

2.4.1. Phase 1

The literature review of Phase 1 involved mainly desk research. To review the existing literature Scopus, a database of peer-reviewed research literature (Elsevier, 2018), was used. The research that contained the relevant key words and that was relatively recent (published after 2013) was reviewed. A review of the abstract provided a first contact with the article. If the article was relevant, the full article was then reviewed. Besides looking at recent literature, the references of the articles reviewed were also taken into consideration, in a quest for key publications that may be less recent.

At some points of the literature review, the research found through the structured review of the articles in Scopus did not provide sufficient results. In this case Google Scholar was used, and the articles found through Google Scholar where analyzed following a similar approach to what has been described for the articles from Scopus.

Finally, for the review of digital platforms, the study had the support of researchers that have specialized in the field, through an successive exchange of emails.

2.4.2. Phase 2

The exploratory case study in Phase 2 aimed to observe the project at the company from different angles and with multiple methods, in order to get a good understanding of the project. The project involved the introduction of the learning platform to a specific community within the company: the employees dedicated to pricing throughout the whole company.

Desk research

To study the context of the project, desk research was done. This includes an analysis of the information available in the company public website and internal information available to the researcher through an internship at the case company. The outcome of the desk research is found in chapter 4.

Semi-structured Interviews

The main data collection method used for the study are semi-structured interviews. In unstructured interviews the interviewer does not have planned questions for the interview, while in structured interviews there is a list of predefined questions. In this study, there was a set of topics that the interviews aimed to cover, and a set of default questions, but the interviews aimed to get a general understanding of the situation of the interviewee, and thus the questions were generally not followed. A copy of the transcripts can be found in the Appendix B.

Sampling The sampling design chosen was purposive sampling. Purposive sampling is a non-probability sampling design where the aim is to get some information from a specific target group because of a certain criteria (Sekeran & Bougie, 2013). There are two main types, and for this study quota sampling was chosen. Quota sampling ensures that certain groups are adequately represented in the study (Sekeran & Bougie, 2013). Because the pricing function within the study company differs geographically and hierarchically, the sampling was done to ensure that pricing experts from all the regions were included, and that different types of pricing experts (experienced and new, from the regional Hub and from the local market organizations) were included.

Data Analysis The data obtained in the interviews was qualitative data. According to Miles and Huberman (1994) there are three steps in qualitative data analysis: Data reduction, Data display, and Drawing conclusions from the data.

Data reduction involves coding and categorizing the data (Miles & Huberman, 1994). This was facilitated by a Computer-Assisted Qualitative Data Analysis Software (Atlas TI). The codes and categories used were based in the preliminary theory from Chapter 3, and when necessary, codes and categories where changed or refined during the process.

To display the data in an organized and condensed manner (Miles & Huberman, 1994), the functionality of Network view from Atlas TI was used. The network view of all the codes within a category, and the quotes linked to the codes helped to organize the data and discover patterns and relationships in the data (Sekeran & Bougie, 2013). The complete list of quotes can be found in Annex A, and the outcome of the data reduction and display can be found in Chapter 5.

3

Literature Review

This chapter presents a literature review that helps to define and frame the factors that influence the implementation of learning platforms. First, the review provides insight into the concept of learning in the workplace, with an emphasis in learning beyond the formal training approach. Secondly, it explores the existing literature about implementation of learning platforms. A general understanding of what is a digital platform is first provided, followed by a review of the studies on the implementation of different technologies related to learning. Dilemma theory is discussed at the end of the literature review with a focus on its influence in change management.

By reviewing the existing literature on implementation of digital learning platforms, it becomes apparent that there is a gap in the literature regarding learning platforms, there is a lack of integrated knowledge. Different fields that have a relation with learning in the workplace have been studied but there is a need to integrate the findings from different fields to get a better understanding of the factors that influence the implementation of learning platforms. At the end of this chapter, a model is presented that integrates the existing research regarding the adoption of technological solutions that are directly

related to learning in the workplace. This includes Corporate Wikis, Enterprise Social Networks (ESN), Learning Management Systems (LMS), and e-Learning 3.0.

Another important insight that emerges from the literature, is that even though the factors that influence the adoption of such technologies for workplace learning have been thoroughly studied, it has not meant the end of unsuccessful introductions in practice. This study introduces the dilemma theory to discuss the tensions that emerge among the factors that have been claimed to influence adoption of technologies for workplace learning. The dilemma-reconciliation method is then introduced as a key contribution to dilemma theory.

Finally, the findings are aggregated into a model with three important elements: The factors, the dimensions in which they are structured and the dilemmas that emerge among them. The aim of the model is to contribute to a better understanding of the factors that influence adoption of learning platforms, and how the dilemmas between them can hamper the adoption of the platform.

3.1. Learning in the workplace

The link between learning and knowledge management with organizational performance has been thoroughly studied (Falconer, 2006; Little, 2015; Heisig et al., 2016). There is evidence that organizational learning (learning that takes place in organization in the interaction amongst individuals, groups, and the organization) is beneficial to the organization (Falconer, 2006), improving innovation and developing competences.

Classic models of learning conceptualize it as a cyclical process, where applying new knowledge gives rise to new experiences that provide new insight (Salas, Weaver, & Shuffler, 2012). Theories about learning emerged during the 20th century, to be used to improve organizational performance (Arets et al., 2015). Their understanding of what

is learning differs, and thus their pedagogic characteristics vary: Behaviorism favored task-centered learning, while cognitivism preferred formal learning and social constructivism focused in problem-based learning (Salas et al., 2012). The acknowledgement that adults learn differently from students, fostered the interest in adult learning, with Knowles (Knowles, 1973; Knowles, Swanson, & Holton, 2005) foundational work recognizing five significant factors impacting adults learning: Adults are autonomous and self-directed, bring their own knowledge and experience into the learning environment, are goal-oriented, problem-focused, and their motivation is internally driven (Salas et al., 2012). The theories about learning helped to drive the models for learning at the workplace (Salas et al., 2012).

Until recently, organizations have relied upon learning that occurs through formal training and through development programs (Noe et al., 2014), but this perspective is getting more and more challenged by two factors: Resource limitations and a change in the scope of learning. In a global company, the travel expenses associated to face-to-face training can become expensive with a workforce dispersedly located, increased by the cost of the absence of the trainees during the training (Noe et al., 2014). On the other side, there is increasing research that supports that informal learning has a higher impact than formal training when it comes to developing people in organizations (de Grip, 2015).

Informal learning is a learning activity that occurs outside of the scope of organized learning activities, self-managed by the employee in terms of extent, depth and timing (ASTD, 2008). Research finds that learning occurs mainly in the informal aspects of an organization, outside of its structure (R. Cross, 2004). It has been argued to be as much as 96 percent of the time spent developing new skills (Arets et al., 2015).

An important component of informal learning is social learning, that is, learning by working together with others (ASTD, 2008). Social learning occurs through observa-

tion, imitation and reinforcement (Bandura, 1982). With advancements such as social medial, the social context for learning has drastically changed, providing access to a greater network (Noe et al., 2014). Communities of practice have been introduced in organizations to facilitate social learning within a certain area of expertise (Noe et al., 2014), and to facilitate the development of human capital resources through knowledge sharing at the organizational level (Kirkman, Mathieu, Cordery, Rosen, & Kukenberger, 1982).

3.2. IT and Learning

3.2.1. Facilitating tacit knowledge sharing

Companies today find themselves in a rapidly changing, extremely competitive, knowledge-intensive and technology-oriented environment (Tynjälä & Häkkinen, 2005), that urges them to find flexible and cost-effective modes of learning (Ketcha, Johannesson, & Bocij, 2015). It is expected that IT can help finding solutions for the pressures that learning in the workplace is facing (Tynjälä & Häkkinen, 2005).

The use of digital technologies to support learning in the workplace is nowadays uncontested. Online learning is emerging as one flexible and cost-effective solution, as well as mobile and ubiquitous (Ketcha et al., 2015). Yet, the many advantages that it brings may be overweighted by its lack of face-to-face contact, which has been argued to hinder the sharing of tacit knowledge (Falconer, 2006). The literature on knowledge management agrees that there are two kinds of knowledge: explicit and tacit knowledge. Explicit knowledge refers to knowledge that can be articulated and coded. Tacit knowledge refers to the experience, know-how, insight, expertise…that an individual holds (Ketcha et al., 2015).

Critics claim that the lack of face-to-face contact cannot lead to effective transfer

and sharing of tacit knowledge, which is critical when we consider that much of the knowledge in organizations is tacit rather than explicit (Falconer, 2006). The debate whether it is possible to share tacit knowledge through digital technologies has been present for a long time. However, an increasing volume of research is arguing that social web tools and other features of the web 2.0 (technologies that enable social interaction) and the web 3.0 (having machines understanding the meaning of data instead of only displaying it (Morris, 2011)) can overcome most of the challenges (Panahi, Watson, & Partridge, 2013).

IT can contribute to the sharing of tacit knowledge by creating environments that provide a space to share collective experiences, encouraging the expression of tacit knowledge. From a different perspective, Stenmark (2000) argues that instead of trying to capture and manage tacit knowledge, IT needs to provide a space for social interaction that results in a better flow and exchange of tacit knowledge. The literature arguing in favor of technology-enabled learning is dominating the conversation, and the advancements in web 3.0 seem to only improve the possibilities for learning in a digital setting. While we must keep in mind that there is still controversy in the field, we can consider that digital platforms are an effective way to facilitate learning in the workplace.

3.2.2. Learning Platforms

Digital platforms can be an effective mean to transfer and share tacit knowledge, overcoming the challenges highlighted in the previous section. Digital platforms can enable the creation of an environment that facilitates sharing experiences and social interaction. In this section, digital platforms are conceptualized and the evolution of e-learning is reviewed.

Digital Platforms

Technologies such as mobile computing, cloud computing, or social media are referred to as digital platforms (Sedera, Lokuge, Grover, Sarker, & Sarker, 2016). A platform (digital or non-digital) is seen as a stable core and a variable periphery (C. Y. Baldwin & Woodard, 2009). This infrastructure provides opportunities for modularization and distributed development (de Reuver, Sorensen, & Basole, n.d.). Digital platforms can be defined as technical artifacts where the platform is an extensible code-base that can be complemented in modules (de Reuver et al., n.d.). Technology platforms are creating the potential to organize and execute work in novel ways, enhancing organizational effectiveness (Purvis, Sambamurthy, & Zmud, 2001).

The characteristics of digital platforms include ease of maintenance, ease of connectivity with other technologies, trial-ability, need for less-specialized skills, flexibility, higher processing capability, low cost, and re-usability for different purposes (Sedera et al., 2016). Furthermore, they enable the distributed creation of features by third-parties, or even the end user (de Reuver et al., n.d.). Digital platforms provide creative solutions to organizational challenges (Sedera et al., 2016). In today's knowledge society, learning in the workplace is one of such challenges (Tynjälä & Häkkinen, 2005).

Besides the characteristics of digital platforms, one important aspect of facilitating learning in the workplace through IT, is the fact that one IT system rarely works in isolation (Hanseth & Lyytinen, 2010). According to Hanseth and Lyytinen (2010), information infrastructures are composed of other platforms, applications, and IT applications, and their dynamics are path dependent and affected by network effects. To acknowledge this effects is paramount to design new platforms that can be successful within the ecosystem of exiting IT.

Evolution of e-learning

E-learning, as the practice for using IT to create learning experiences (Horton, 2006), has been present for decades (Bezhovski & Poorani, 2016). Its origins can be related to the Computer-based training of the 1960's (J. Cross, 2004), followed by CD-based training in the 90's (Bezhovski & Poorani, 2016), until Web took over CD by providing an interactive learning experience in the end of last century (J. Cross, 2004).

With the popularization of e-learning, the first Learning Management Systems (LMS) emerged to organize, record and deliver e-learning courses (Bezhovski & Poorani, 2016). In the recent years, these systems have evolved to provide interactive features and now are embracing mobile technologies. The advancements in technology have enabled a learner-centric approach in contrast with the content-centric approach of the first generations (Deloitte, 2017).

3.3. Adoption of Digital Learning Platforms

There is a gap in the literature regarding learning platforms, there is a lack of integrated knowledge. If we focus in formal trainings, online training (or e-learning) has been thoroughly studied. If we focus in on social learning, either online or face to face, the field is also well researched, with an important body of knowledge regarding communities of practice, and the field of ESN. Finally, if we focus in knowledge management and knowledge sharing, we find a rich field of research, with dedicated journals and hundreds of publications.

All this research indirectly contributes to the body of knowledge about learning in the workplace, from different perspectives. However, by focusing on one facet of workplace learning, the findings of this research don't cover the implications for learning in the workplace as a whole.

The following section reviews the knowledge regarding the adoption of technological solutions that have been researched in these different fields and that are directly related to learning in the workplace. This includes Corporate Wikis, ESN, LMS, and e-Learning 3.0. First, the literature regarding the adoption of new technologies, either for learning or not, is reviewed. The research about technology acceptance will set the basis before focusing in technologies to enhance learning.

3.3.1. Technology Acceptance

Information Technology is nowadays ubiquitous in organizations. Yet, without the acceptance and usage by employees their impact in productivity gets hampered (Venkatesh et al., 2003). User acceptance of new technology is a well-researched field, and for the past few years there have been efforts to unify the different theories that have been developed (Venkatesh et al., 2003) (Venkatesh, Thong, & Xu, 2016).

A Unified Theory of Acceptance and Use of Technology (UTAUT) was developed by Venkatesh et al. (2003). UTAUT identifies performance expectancy, effort expectancy, social influence, and facilitating conditions as the four key factors related to predict the intention to use a technology and the actual use it eventually has in organizations, with four moderators (age, gender, experience and voluntariness). Performance Expectancy, effort expectancy and social influence affect behavioral intention and behavioral intention to use the system and facilitating conditions affect use behavior (technology use). The definition of these factors is the following (Venkatesh et al., 2003):

- Performance expectancy: The degree to which an individual believes that using the system will help him or her to attain gains in job performance.
- Effort expectancy: The degree of ease associated with the use of the system.
- Social influence: the degree to which an individual perceives that important others

believe he or she should use the new system. Three social influence mechanisms play a role in understanding the social influence processes: Compliance (performing a behavior in order to attain certain rewards or avoid punishment), Identification (belief that performing a behavior will elevate his or her social status within a referent group), Internalization (incorporation of a referent's belief into one's own belief structure).

- Facilitating conditions: the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system.

Regarding the applicability of technology acceptance models to the KM domain, Venkatesh and Bala (2008) argues that the considerable body of previous TAM-related IT research may be applied usefully to the knowledge management (KM) domain. KM and organizational learning (OL) are two closely related concepts, since both deal with the continuous improvement of the knowledge workers performance (Heisig et al., 2016). By having a basic understanding of the UTAUT model, the following subsections that discuss the success factors for the adoption of learning technologies can be complemented with the contributions of the IT field.

3.3.2. Success factors for learning platforms

Corporate Wiki

A wiki is a Web 2.0-based social platform (Hussain-Alqahtani, 2014), an online hypertext system that enables collaborative editing via monitoring through a framework that maintains users' updates and/or contributions to the available edited text (Wang & Wei, 2011).

In his study, Hussain-Alqahtani (2014) examined factors impacting employees' use of corporate wikis for knowledge sharing and diffusion, and found 5 key factors, namely:

- Relevance of Enterprise Wikis: The degree to which individuals believe a technology is applicable and useful in the work environment.

- Top Management Support for Enterprise Wikis: encompasses management recognizing the importance of emerging technology, sharing this belief with others, and being involved in its adoption.

- Complexity of Enterprise Wikis: Beliefs regarding how difficult it is to learn and use a system.

- Technical Support for Enterprise Wikis: providing assistance to users of information systems by IT experts, who meet IT users' needs by providing instruction and guidance, as well as by coaching and motivating users to use IT systems.

- Knowledge-sharing Self Efficacy: Wiki users' confidence in their ability to use wikis to create and share knowledge

When relating these factors to the UTAUT framework, there is a correspondence between the factors found for corporate wikis and the more generic framework of the UTAUT. As it can be seen from the concepts' definition, relevance of enterprise wikis relates to performance expectancy, complexity of Enterprise Wikis relates to effort expectancy, Top Management Support relates to Social Influence, and Technical Support can be seen as a facilitating condition. With regards to knowledge-sharing self-efficacy, the user's confidence in their ability to use wikis is related to effort expectancy, how difficult they think it will be to use the Wiki for them. One endogenous factor (complexity of the wiki) and one exogenous factor (knowledge-sharing self-efficacy) comprise the construct "effort expectancy" in this framework.

Enterprise Social Network (ESN)

ESN applies Web 2.0 to the organizational context. Web 2.0-based technologies are web-based social software that facilitates collaboration, communication, and information flows (Hussain-Alqahtani, Watson, & Partridge, 2012). ESN is defined as a platform that allows everyone in an organization to "(1) communicate messages with specific coworkers or broadcast messages to everyone in the organization; (2) explicitly indicate or implicitly reveal particular coworkers as communication partners; (3) post, edit, and sort text and files linked to themselves or others; and (4) view the messages, connections, text, and files communicated, posted, edited and sorted by anyone else in the organization at any time of their choosing" (Leonardi, Huysman, & Steinfield, 2011).

ESN differs from more conventional IT in its flexibility and voluntariness of use (Pei-Yee-Chin et al., 2015) in a way which has been asserted to imply that the factors contributing to usage of ESN are significantly different from conventional IT, requiring new theoretical frameworks to study the technology adoption (Pei-Yee-Chin et al., 2015).

In their study of the factors that influence the use of ESN among employees, Pei-Yee-Chin et al. (2015) draw from Bostrom and Heinen (1977) socio-technical approach, where the factors are presented into five dimensional factors: Technological, Organizational, Social, Individual and Task (or TOSIT). The technological and the task level form the technological subsystem, and the organizational, social and individual levels form the social subsystem. Over 30 enabling and inhibiting factors are found grouped in 10 higher constructs, shown in 3.1.

In contrast with the UTAUT framework, which is more synthesized, the five dimensional factors allow for a higher level of detail when identifying factors, highlighting some factors that could go unnoticed if aggregated into more generic factors. For instance, time commitment at the individual level refers to the inhibiting role that lack of time has

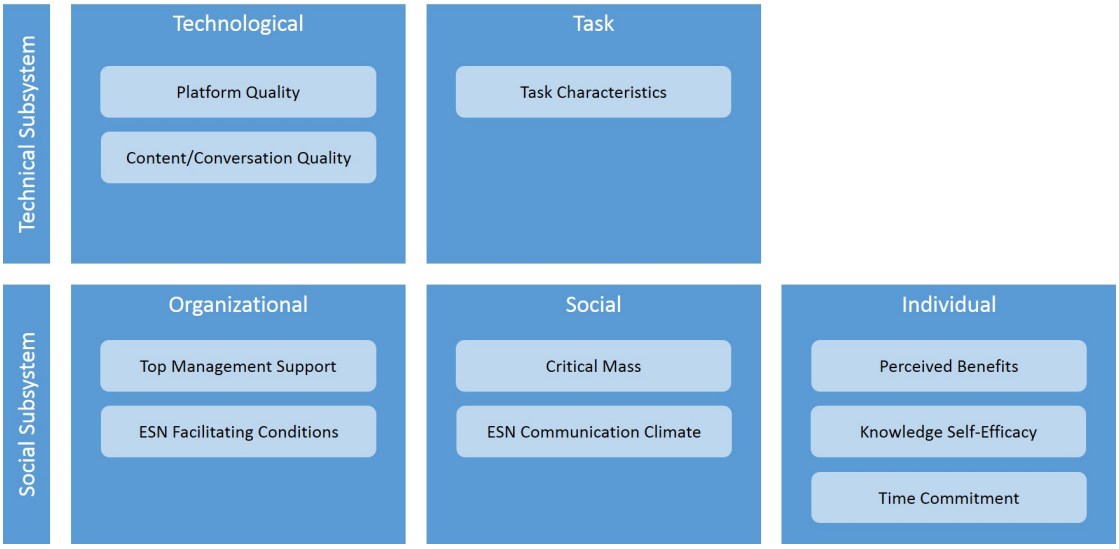

Figure 3.1: Socio-technical factors in the use of ESN, adapted from (Pei-Yee-Chin, Evans, Kim-Kwang-Choo, & Tan, 2015)

in usage of ESN. While it could be included in "facilitating conditions" in the UTAUT, making it explicit ensures that the factor will be taken into account.

Web 3.0 for learning: e-learning 3.0

The evolution of the world wide web goes from the "Web 1.0" – with a read-only approach – to the "Web 2.0" – read/write web that enables interaction – towards the rising "Web 3.0" (Shawky et al., 2013). Web 3.0 attributes meaning to data, by converting it into machine understandable formats (Ohler, 2008). By attributing meaning to data, it enables new ways of communication between people and machines and improves creation and re-usability of content (Miranda et al., 2016).

There are three main components in Web 3.0's definition: Web 3.0 is Semantic, Mobile and Immersive (Miranda, Isaias, & Costa, 2014). The semantic aspect relates to the software's ability to "use natural language" and "understand the meaning of data". The mobility aspect relates to the opportunity of having a omni-device experience and richer navigation experience. The immersive aspect concerns virtual and augmented

reality and 3D settings (Miranda et al., 2014).

E-Learning has been accompanying the development of the Web and incorporating the technological innovations that have emerged. While E-learning 1.0 was one-directional and e-Learning 2.0 became interactive and dynamic, e-Learning 3.0 adopts the new possibilities granted by the development of the Web 3.0 (Miranda et al., 2017). Web 3.0 has the potential to contribute to e-Learning's independence, institutional decentralization, self-organization and growing interaction (Miranda et al., 2016).

The emergence of e-Learning 3.0 has already been documented by some authors (Miranda et al., 2017). However, the focus of the studies has leaned towards higher education, with no literature addressing the topic of e-Learning 3.0 in the workplace. This limits the applicability of the findings of these studies to the study of the adoption of corporate digital learning platforms. Still, the frameworks developed and the factors highlighted can provide valuable insight.

Miranda et al. (2014) develop a framework for understanding the Critical Success Factors (CSFs) that influence the adoption of an e-Learning 3.0 system. CSFs are activities or components that must be addressed to ensure the adoption of the e-Learning 3.0 system (Miranda et al., 2014), providing thus direct recommendations. After the framework's validation (Miranda et al., 2017, 2016), the CSFs are organized in a threefold structure encompassing technology, content, and stakeholders. The three dimensions and their CSFs are depicted in 3.2

This framework's inclusion of the content dimension in addition to the social and technological dimensions puts emphasis in the importance of the factors related to the content instead of maybe including them within technology. A framework for Digital Learning Platforms could also benefit from distinguishing this third dimension instead of taking a pure socio-technical perspective.

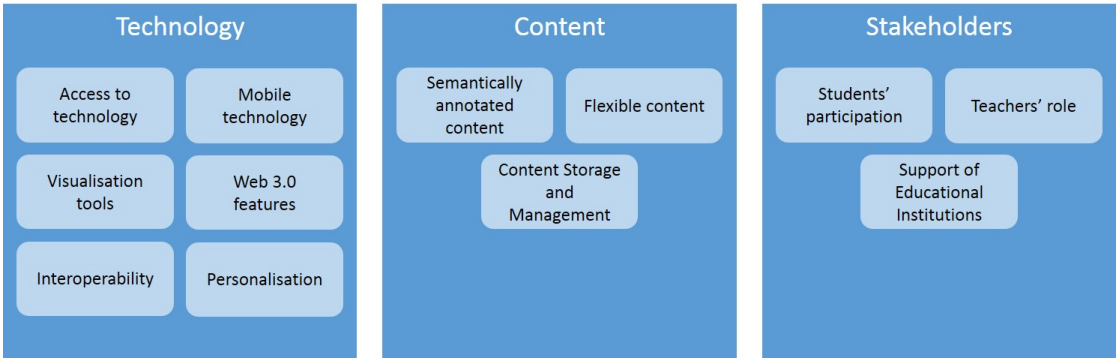

Figure 3.2: Critical Success factors for e-learning 3.0, adapted from Miranda, Isaias, and Costa (2014)

Discussion of the models presented

The model for the UTAUT has a high explanatory power (Venkatesh et al., 2016), and can be applied to any technology being introduced. The generalization power of the UTAUT theory is not a critical asset for the present study, which aims at focusing on a specific technology, the Learning Platforms. However, because of the high explanatory power of the theory, and the maturity of the research in acceptance and use of technology (Venkatesh et al., 2003), the main constructs that the model defines should be discussed for the creation of a framework for the adoption of Learning Platforms.

The approach taken for ESN and e-learning 3.0 differs with wikis and the UTAUT in that it does not seek to synthesize the factors that affect adoption in a few constructs with high explanatory power. The models for ESN and EL3.0 are more exhaustive and detailed, partly because they are focused in one specific technology. These studies make it easier to give recommendations to practice, while the UTAUT aimed at integrating and synthesizing the theory around technology acceptance, and favored model simplicity versus a higher level of detail.

A relevant aspect of these two models is also the dimensions that they include. The list of factors that influence adoption is extensive, and thus the authors choose to structure it in higher-level constructs. In the case of ESN, Pei-Yee-Chin et al. (2015) take

a socio-technical perspective, distinguishing the technical and social subsystems, and within them they find five dimensional factors (technology, task, organizational, societal, individual). In the case of EL 3.0, three dimensions structure the critical success factors for the adoption of EL 3.0: Technology, content and stakeholders.

From this literature review it becomes clear that the factors influencing the adoption of technologies for learning have been thoroughly studied. It is thus worth asking what additional research can contribute to more successful implementations of digital learning platforms. If the factors are well understood, a useful stream of research would be to look at what happens when an organization tries to put the critical success factors in place, to achieve a successful adoption of the platform. When a company implements a new learning platform, a factor that is highlighted in all the studies is that usefulness is key to adoption. However, when the platform has different user groups (as is to be assumed for a large organization), what makes the platform useful for one group may hinder usefulness for another group. Moreover, its usefulness may be in tension with its complexity, as adding features to the platform to make it more useful may result in a complex platform. As shown in the examples given, often it is not enough to know the factors that influence the successful implementation of a learning platform. Tensions emerge between the factors, and choosing between alternatives that facilitate diverging factors can lead to an unsuccessful implementation.

3.4. Dilemma Theory

The word dilemma comes from Greek as a combination of di- ‘twice’ and lēmma ‘premise’[1]. It is described as a situation in which a choice needs to be made between two or more alternatives, and it generally refers to situations in which all the alternatives are equally undesirable.

[1] Oxford Dictionaries

Dilemma theory was introduced by Charles Hampden-Turner in his work about conflicting values between different people (Hampdem-Turner, 1970, 1990; Hampdem-Turner & Trompenaars, 2000). As explained above, the traditional understanding of a dilemma is that the outcome will be bad for the decision-maker, since all his alternatives are equally undesirable.

The contribution of dilemma theory is not to offer solutions to dilemmas, but to understand the underlying polarities. Dilemma theory dives into a logic of resolution in which both contrasting premises are reconciled to create synergy. This is known as dilemma-reconciliation.

3.4.1. Dilemma-Reconciliation

A way to solve a dilemma would be to compromise. When two opposing values are compromised, the decision is often suboptimal (Laine & Kuoppakangas, 2015). For instance, if a student has the dilemma of time allocation, whether to study the theory or practice exercises, 50:50 split may not be the best solution, as maybe dedicating 50% of the time to theory is not enough to gain an understanding about the topic, and without that the time dedicated to practice is time thrown away. The student may have got a better result dedicating 80% of his time to the theory, and then practicing once the concepts were clear. This approach may have been more synergistic, where the time dedicated to exercise would have been more productive thanks to a clear understanding of the theory, arriving to a situation where both opposing uses of the time were fully realized.

As seen in this analogy, identifying the dimension of the dilemma is key, and it allows us to decide on positioning along the dimension to achieve synergies. This decision-making about positioning is known as the reconciliation process (Laine & Kuoppakangas, 2015; Hampdem-Turner & Trompenaars, 2000).

3.4.2. Dilemmas and change management

In change management, the dilemma-reconciliation method is used to facilitate both operational and leadership decision-making (Kuoppakangas, 2013). In the organizational context, the focus is not in insoluble paradox, but in "practical dilemmas" that have the potential to create synergies when the contradictory values are properly reconciled (Laine & Kuoppakangas, 2015). Moreover, decisions in the context of change management are made knowing that decision-making is an ongoing process (Kuoppakangas, 2013).

When applying dilemma-reconciliation for change management, the basic assumption is that the contradicting values are interdependent and that the issue that causes the dilemma needs to be at the core of the reconciliation process. The value in identifying the extremes of a dilemma lies in understanding the issue and recognizing the organization's relative position (Kuoppakangas, 2013). By understanding the dimensions of the situation and the change that we aim at, we are one step closer to reconciling its underlying dilemmas.

The insight from the dilemma theory is valuable for the development of a model for the adoption of learning platforms. There are tensions within and between the factors that influence adoption of learning platforms, and identifying the extremes of the dilemmas has been argued to be a key step towards the reconciliation of the dilemmas. The model developed should facilitate the identification of tensions, and their extremes.

3.5. Model for the adoption of Learning Platforms

In this section, building from the understanding acquired throughout this chapter, a discussion about a model for the adoption of Learning Platforms follows.

3.5.1. Dimensions

Regarding the dimensions of the model, a socio-technical approach is taken. The Socio-technical approach views the organization as a work system with two interrelated sub-systems, technical and social, and views the output of a work system as a result of the interaction between the two subsystems (Bostrom & Heinen, 1997). It is therefore important to consider both subsystems and its interactions. However, this model distinguished a third dimension, content. By taking a pure socio-technical perspective, the factors related to the content would be distributed within both subsystems, with factors such as content retrieval being part of the technical subsystem, and content creation leaning towards the social subsystem. Because of the importance of the content-related factors for the adoption of the learning platform, more clarity is achieved if a triadic perspective is chosen, with three dimensional factors: Social, Technical and Content. This approach is similar to the one chosen by Miranda et al. (2014) in their study of e-Learning 3.0.

3.5.2. Factors

The factors that have been highlighted in the literature are considered for inclusion in the framework. An equilibrium has been sought to choose the depth of the framework. A high level of detail can emphasize the factors that are found influential in the literature, without merging them in a higher construct difficult to apply to a real case. On the other side, using a limited number of factors gives the model simplicity, with generic factors that are not exclusively relevant for learning platforms. Each dimension has 4 factors: Content creation strategy, content flexibility, content quality, and supported ways of learning for the Content dimension; community engagement, community management, individual characteristics and organizational support for the Social dimension; IT ecosystem, platform complexity, platform flexibility and platform quality for the Tech-

nical dimension. For support, Table 3.1 contains a summary of the factors described in this section.

Content Dimension

Content Creation Strategy User generated content is considered a critical success factor for e-Learning (Miranda et al., 2017). This is also supported by the literature regarding workplace learning (Falconer, 2006). In the IT literature it has been argued that social web technologies enable the sharing of tacit knowledge, while traditional LMS had focused more on information management (Panahi et al., 2013). According to Panahi et al. (2013), also media types affect the ability to share tacit knowledge. Therefore, the possibilities available to create content, and the strategy chosen (top-down, bottom-up, professional editing, amateur-looking…) is included as a factor in the model.

Content Flexibility Flexible content is considered a critical success factor for e-Learning (Miranda et al., 2017). It is key that the content is dynamic (Miranda et al., 2017), and that it can be updated at the speed of business. Whether the content is flexible impacts the relevance of the content, which is also considered as a key factor in the model for the adoption of corporate wikis (Hussain-Alqahtani, 2014).

Content Quality Quality of content can be defined as the degree to which the content delivers value, solves a problem, and its delivered in a way that meets the expectations of the audience (Yuhl, 2017). In the literature review, ”Content/Conversation quality” is identified as a factor influencing ESN use (Pei-Yee-Chin et al., 2015), since irrelevant and non-work related content was found to discourage the usage of ESN.

Supported ways of learning In the literature review, the change in the scope of work-place learning has been identified as one of the most important trends (de Grip, 2015). Informal learning is key for the organization, and thus a learning platform should facil-

itate it. Some studies have put in doubt that informal learnings needs to (or can) be steered (Panahi et al., 2013; Arets et al., 2015), but many claim that IT can support and foster informal learning. Therefore, the extent to which the learning platform supports also informal learning besides formal learning has been included in the model.

Social Dimension

Community Engagement For Wikis and ESN, the engagement of the user's community has been identified as a factor that impacts adoption (Pei-Yee-Chin et al., 2015; Hussain-Alqahtani, 2014).

Community Management In the literature about technology acceptance, facilitating conditions are considered to influence the acceptance and use of the technology (Venkatesh et al., 2003; Venkatesh & Bala, 2008; Venkatesh et al., 2016). The figure of a community manager supports the use of the system, and thus can be considered a facilitating condition. Having a community manager is highlighted as a factor positively influencing the usage of ESN (Pei-Yee-Chin et al., 2015).

Individual Characteristics The great majority of the studies reviewed consider that the unique characteristics of the user will have a big influence in the eventual usage of the platform. Characteristics such as knowledge self-efficacy (Pei-Yee-Chin et al., 2015), motivation and commitment (Miranda et al., 2014), level of experience (Venkatesh & Bala, 2008), age and gender (Venkatesh et al., 2003), and culture (Venkatesh & Bala, 2008); have been researched to have an impact on the users' adoption of technologies.

Organizational Support Organizational support, which encompasses technical support and top management support, is widely accepted as an influencing factor (Pei-Yee-Chin et al., 2015; Hussain-Alqahtani, 2014; Miranda et al., 2017; Venkatesh & Bala, 2008).

Technical Dimension

IT ecosystem As highlighted by Hanseth and Lyytinen (2010), the coexistence of different platforms and applications brings complexity to the IT ecosystem of a company. The design of the information infrastructure of a company will thus play a role in the adoption of the learning platform.

Platform Complexity A high level of complexity implies a high degree of effort needed to learn and use the learning platform, thus increasing what in the UTAUT model is called ”effort expectancy” (Venkatesh et al., 2003). The importance of having a tool that is easy to use is also highlighted in the literature about e-learning 3.0 (Miranda et al., 2014) and the corporate wiki (Hussain-Alqahtani, 2014), and thus it has been included in the model.

Platform flexibility Analogously to content flexibility, the ability of the platform to adapt and be dynamic also contributes to its adoption. This has been discussed in Pei-Yee-Chin et al. (2015), where having limited functionalities was seen as a factor with a negative influence in the usage of the ESN, and also in the literature about the adoption of wikis (Hussain-Alqahtani, 2014). The modularity of the platforms contributes to the technology's flexibility (de Reuver et al., n.d.)

Platform Quality Platform quality is to be understood as the quality of the experience of the user with the platform (le Callet, Möller, & Perkis, 2012). The quality of the technology being adopted has been identified as an influencing factor along the literature, being present in the majority of the studies reviewed. In this model the quality of the platform is separated from the quality of the content available in the platform, as it is the case for the model about the use of ESN (Pei-Yee-Chin et al., 2015).

3.5.3. Dilemmas

The structure of the model reinforces the visibility of the underlying tensions among factors. By structuring the model in dimensions, three categories of dilemmas can be identified: Intra Factor, Inter Factor-Intra Dimension, and Inter Factor-Inter Dimension.

A factor argued to influence the adoption of learning platforms are the individual characteristics of the user. However, users with different characteristics will be using the platform. Should the learning platform focus on serving the characteristics hold by the majority of the platform? Should the learning platform seek to balance how it works, in a way that doesn't focus in supporting any specific type of user? Having a platform that is adapted to the individual characteristics of the user makes an intra-factor dilemma emerge.

An option would be to offer a large set of features to the user, in order to adapt to all possible types of user. However, to adapt to all the user profiles in a diverse and large workforce, would need a high degree of personalization, that would inevitably increase the complexity of the platform. In this case, the dilemma is between different factors that are part of different dimensions: Inter-Factor and Inter-Dimension.

Finally, dilemmas can also be found between factors of the same dimension. A factor illustrated in the model is the content creation strategy, that is the policies and processes to create the content. In order to have content that supports social learning (as highlighted by the factor "support of all means of learning"), the platform would need policies and processes that allow the users to create and share content, to facilitate the interaction between users. However, allowing peer-generated content is a risk for the quality of the content, as it is not validated by a central actor. A tension emerges between content creation strategy and content quality.

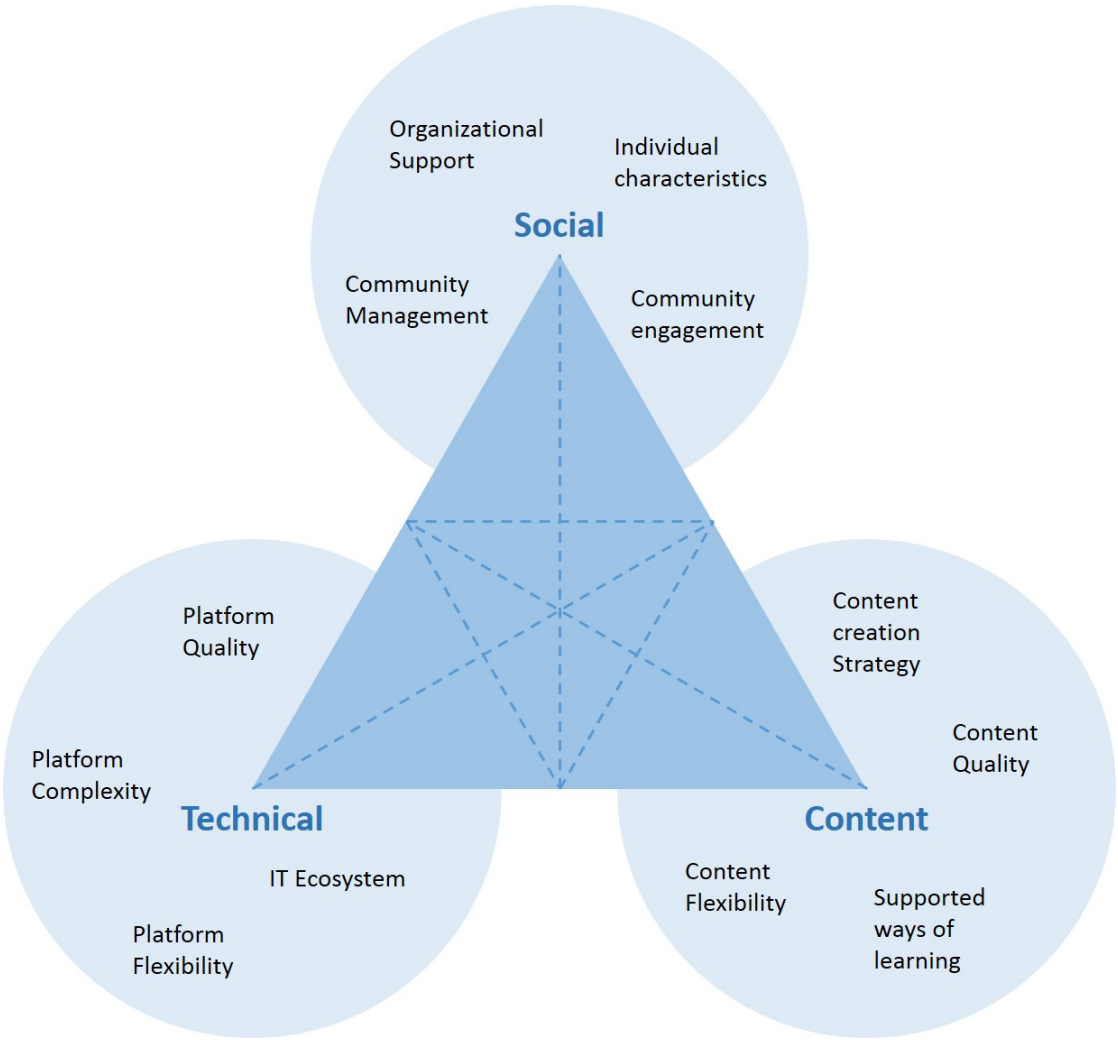

Figure 3.3: Proposed model of factors that influence the adoption of learning platforms in organizations.

3.5.4. Model

In Figure 3.3 the model is represented, including the factors that influence adoption of the learning platform and the three-dimensional factors. The dotted lines bring visibility to the presence of tensions within and between factors, within the same dimension or not. In Table 3.1, the factors discussed in the previous section are summarized.

Table 3.1: Definition of factors of the model for the adoption of learning platforms in organizations.

Factor	Definition
Content	
Content creation strategy	Refers to the content creation strategy chosen in terms of owner (user-generated, top-down approach, generated by an external agency...), and means (different types of media, degree of professional editing).
Content Flexibility	Refers to the capacity to update and modify the content, either by its original creator or by any user.
Content Quality	The degree to which the content delivers value, solves a problem, and its delivered in a way that meets the expectations of the audience.
Supported ways of learning	Refers to which ways of learning are supported by the content: Formal learning, social, and experiential.
Social	
Community Engagement	Refers to the mechanisms within or outside the learning platform meant to encourage active participation in the community.
Community management	Refers to the existence of an active role of community management, and his or her tasks and responsibilities.
Individual characteristics	Refers to individual traits of the user.
Organizational support	Encompasses the mechanisms set in place to support the implementation of the learning platform, both explicit (processes and resources) and implicit (management championship, company culture).
Technical	
IT ecosystem	Refers to the ecosystem of information technologies within the firm, the interaction between different technologies, and the difficulty to use these technologies.
Platform complexity	Degree of effort required to learn and use the Learning Platform.
Platform flexibility	Degree to which the platform adapts to each user preferences.
Platform quality	Refers to the quality of the experience of the user with the platform.

4

Background Information

4.1. Background Information

The Hilti Group (known also as Hilti Aktiengesellschaft or Hilti AG) was founded in 1941 in Schaan, Liechtenstein and is a family-owned company held by the Martin Hilti Family Trust. With a presence in 121 countries, the Hilti Group operates a direct sales model - 75% of the people who work in Hilti are facing customers on a daily basis - and employs 25,000 people who work to support customers in all the phases of the customer journey: from the design phase to the sale of the products, from the after-sales services to continuous support through time (Hilti AG, 2018b). The business operates in the construction sector, and it is specialized in the manufacturing and marketing of products related to the activities of construction of new buildings and maintenance of existing ones (Hilti AG, 2018b). The end-users of Hilti products are professional users, which include:

- general contractors (GC);
- architects;
- designers;
- project managers;

- building owners;

and all the professional figures involved in building construction and/or maintenance projects (Hilti AG, 2017).

Hilti presents a very diversified product portfolio. When it was founded by Martin and Eugen Hilti, it started as a mechanical workshop mainly selling power tools and accessories (the Business Unit nowadays known in the company as PT&A). Through time, several products and business units were created. Nowadays, Hilti sells system solutions for construction professionals (Hilti AG, 2017):

- Engineering: Design, specifications, consulting, software
- Measuring and aligning: Distance measuring, leveling and aligning, detection
- Drilling and demolition: Drilling and chiseling, diamond systems
- Cutting and grinding
- Fastening and installation: Direct fastening, screw fastening technology, anchor technology, installation
- Fire-stop and insulation: Construction chemicals, fire-stop
- Services: Fleet management, Hilti Tool Service, Repair service, Delivery service, Lifetime service, Training and consulting

In 2017, Hilti Group generated annual sales of CHF 5.1 billion (Hilti AG, 2017).

4.1.1. Corporate Strategy

The corporate strategy is aligned with Hilti's value proposition (Hilti AG, 2018c):

We passionately create enthusiastic customers and build a better future.

Champion 2020 is the corporate strategy of Hilti, which aims to achieve sustainable value creation through leadership and differentiation. It aims to achieve market leadership through added value for its customers by offering products, services and software

that provide superior productivity and safety to the customers and differentiate from the offering of its competitors (Hilti AG, 2018a).

In order to implement the strategy, Hilti focuses in four areas that constitutes its core competencies.

The first is the product and service differentiation. The differentiation is a result of innovation that comes out of extensive understanding of customers' applications. Hilti offers differentiated, value-adding products and systems, distinguished services and software with complementary products and services. High quality and reliability are key benefits that each Hilti product has (Hilti AG, 2018d).

The direct customer relationship is the second pillar, which signifies that Hilti is the best partner to its customers as it comprehends their needs and converts them into solutions. It serves as one voice, offering one message to the customer, through its multi-channel direct sales. It has segmented, focused teams for different customer divisions. The specialized customer experience results in inspiring customer satisfaction and therefore loyalty (Hilti AG, 2018d).

The third pillar is the operational excellence. Hilti does business in order to meet customer expectations consistently, going the extra mile when needed. It uses state-of-the-art CRM programs, reassuring individual customers knowledge. The value chain is distinguished by total quality, availability and cost competitiveness. The processes and activities are improved continuously and the relationships with the partners and suppliers are built on win-win transactions (Hilti AG, 2018d).

The fourth but equally important pillar for the Champion 2020 strategy is the high performing global team. The employees are highly competent, self-motivated individuals from all over the world who aim to build the ground for success. Hilti offers long-term career opportunities worldwide with investments in personal and professional growth.

Figure 4.1: Depiction of the Champion 2020 strategy, retrieved from (Hilti AG, n.d.)

It is a secure base, where diversity is appraised and equal opportunities are confirmed and good performance is rewarded. The company has 23% women in its teams and 19% women as team leaders (Hilti AG, 2018d).

Figure 4.1 shows Hilti's strategy as explained above, standing on the foundation of a "caring and performance oriented" corporate culture.

4.1.2. Organizational Structure

Hilti has a matrix structure. On one side, the company is divided in Regions (shown in Figure 4.2 and described in the list of abbreviations), which in turn are divided in Market Organizations (MOs). Some mature regions have a Hub in one of their MOs who executes certain business processes that before were at the Corporate Functions

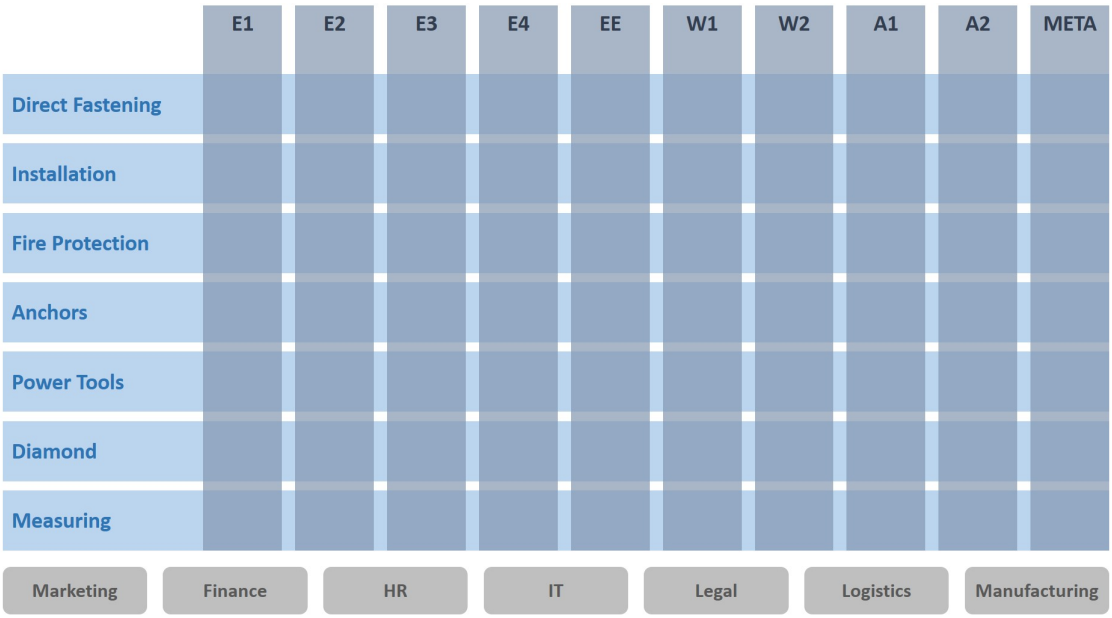

Figure 4.2: Graphical representation of Hilti's Matrix Structure.

level. The sales force is organized geographically, by decreasing level of hierarchy: Head of Market Region, General Manager of MO, General Manager of a Region of the MO, Division Manager, Area Sales Manager (ASM), Account Manager (AM). On the other side, the product portfolio of Hilti is divided in Business Units which are cross-functional. Each business unit has the support of dedicated partners for the different corporate functions. Finally, Corporate functions are set at the Global Level, with the MOs being responsible for adapting what is provided by the global teams to their local market.

4.2. Pricing at Hilti

The case studied in this thesis takes place within the pricing function of Hilti, where content for the learning platform of Hilti was created to support all the pricing experts, from the Hub level to the MO level. To avoid confidentiality issues, the characteristics of pricing at Hilti are not thoroughly explained, and only the parts relevant to the study

are disclosed. This subsection will describe how is pricing structured in Hilti, and which type of tasks are done by pricing experts.

Pricing in Hilti is part of the Strategic Marketing department. Strategic Marketing was set up as a professional function in Hilti in 2002 (Hilti AG, n.d.). Its mission is to support the strategic imperatives of Hilti's strategy (Champion 2020), and does so helping MOs to build direct customer relationships, enabling impactful sales of services and software, and driving operational excellence of Hilti's Sales channel. It is structured in three layers: The global team, which focuses in strategic topics, the Hubs, which connect the MOs of their regions and manage the Market Reach processes (including Pricing), and the MOs which are the marketing counterpart of their local teams, and provide operational support to the business of the MO.

In a pricing role, the employee's responsibility is to ensure that the client will receive the right price in the orders placed. Moreover, a pricing expert has to ensure, together with the product managers and with top-management, that the prices being offered to the customers are in line with the company strategy. To understand the complexity of pricing topics at Hilti it is important to see that, as a company that focuses on product leadership, maintaining prices at the right level is a key imperative, while as a B2B company, acknowledging that different customers need different prices is required. In order to ensure that their prices meet Hilti's strategy, Hilti has a complex ecosystem of tools to track, analyze and manage which price is given to each order, making data quality and exception handling a big share of the local pricing role, while regional pricing teams focus in creating the necessary tools (in collaboration with the IT department) (Hilti AG, n.d.).

Pricing at Hilti is structured as follows (Hilti AG, n.d.): The global team gives strategic support from Hilti Headquarters in Liechtenstein. The Hub in the E3 region (Central Europe) is the global competence center and it is responsible for the infrastructure and

systems for pricing, pricing analytics, commercial excellence and global competence. The other Hubs have a pricing team which ensures that the global agenda and strategy is embedded in regional processes and leads the region's pricing community. There are differences in readiness and expertise among Hubs, according to whether they are in a mature region or an emerging region. Finally, MO focus on ensuring execution of the pricing topics at the local level. It varies widely regionally, with some MOs having more than one dedicated Pricing Expert to MOs where there is one person in charge of all Strategic Marketing topics and dedicates 20% of their time pricing. There are also significant differences in the career path of pricing experts depending on the region, pricing expert can be a stable position where the pricing expert stays for 5 to 10 years, or it can be a path to a position in strategic marketing, where the pricing expert does not stay more than 2 years.

4.3. Learning at Hilti

Hilti uses Fuse as their Learning Platform. Before the launching of Fuse, Hilti had a Learning Management System (LMS) called Skillport. Skillport enabled the storage and retrieval of e-learning modules, that usually targeted the sales force. Corporate functions typically did not have content on Skillport, and employees in corporate functions learned informally, with the support of their team-mates. Fuse, unlike Skillport, supports the Learning Strategy that sustains Hilti's mission, where a core competency is Hilti's high-performing global team. The new Learning Strategy is based on learner-centric experience instead of content centric training (Bezhovski & Poorani, 2016). The new Hilti Learning Strategy emphasizes learning that is needed at the time when it is needed (Hilti AG, n.d.).

Fuse is a new-generation learning platform, that focuses in engaging the workforce through the creation of mobile, social and video based learning experiences (Fuse Uni-

versal, 2017). The platform maps its content based on the 70:20:10 model (Fuse Universal, 2016), which is based in empirical evidence that shows that most of the learning in a company happens outside of the scope of formal learning activities. According to (Arets et al., 2015), roughly 70% of what individuals learn is learned from experiential learning, 20% from social learning and 10% from formal learning (70:20:10 Forum, 2016). Against the criticism that casts doubts into this formula (Jefferson & Pollock, 2014; Kajewski & Madsen, 2012), Arets et al. (2015) claims that the approach is not about the ratio, but an illustration that people in the twenty first century learn anywhere and anytime, also from their work and from others.

Fuse is a cloud-based platform, structured around the mission of capturing and sharing knowledge. As depicted in 4.3, Fuse is organized in communities, where its members can share and retrieve content of any kind (videos, files, links…). Both users and content items can be part of more than one community. Content can be found within a structure, but also unstructured. To structure content, different content items can be grouped into a topic. A topic can be part of a learning plan, that is then assigned to certain users and then their advancement through the learning plan can be tracked. Unstructured content is uploaded into a community, and it can be found through Fuse's search engine, a smart search engine with machine learning technology that provides search results based on the user's behavior. A more detailed explanation of how Fuse works can be found in Annex C.

Since its introduction, Fuse at Hilti has gone through some modifications. Now, for confidentiality issues and to ensure that users only have content which is relevant to them, all the communities are private. Private communities can only be seen by its members, and their content is only searchable for its members. Hilti has followed an Agile approach to deploy Fuse, and communities have been created ad hoc upon request, instead of in a structured plan. Right now, Fuse is experimenting some bugs in

its performance when used with Internet Explorer, the navigator used in Hilti for all the company applications.

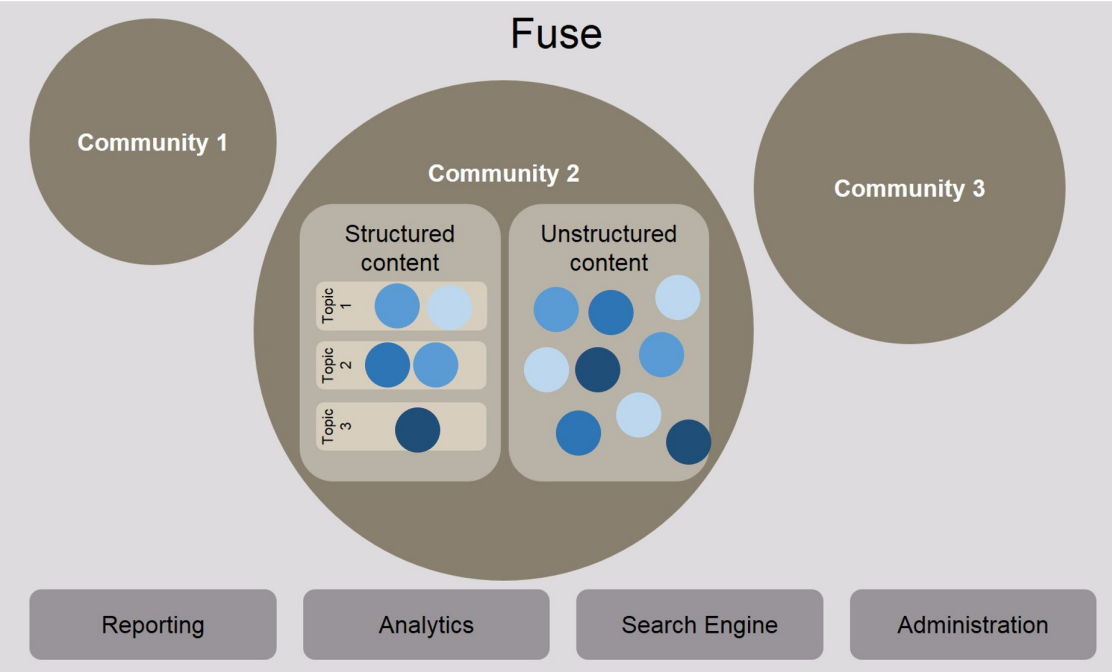

Figure 4.3: Visual representation of how is Fuse structured.

5

Case Study

5.1. Creation of a Global Pricing Fuse community

In September 2017, a community for Pricing was created in Fuse. The main goal was to use the community to share training material about a new set of tools developed to support pricing experts in a process called Agreement Review. These tools, called PMT and PAM, where to be released beginning of 2018, but are now set to be released in September 2018.

The initial aim was to develop training material for the sales force, as they are also part of the Agreement Review process. When the release of the tool was delayed, the development of training material for the sales force had to be postponed. The focus of the efforts in Fuse turned again to the Pricing Experts, and the following needs were identified:

- Need for an alignment in the understanding of pricing high-level topics
- Need for simple and easy to find information that supports pricing main processes and tools. Until that moment, the platform available for process documentation,

GPMS, was a comprehensive repository of all the information available, and it was difficult to navigate without a previous knowledge of the processes it documented.

- Need to build a community with stronger ties. Many tools were being developed in different regions to support their processes, but the efforts were rarely shared, leading to inefficiencies.

Therefore, a project was launched to build a Global Pricing learning community in Fuse, where pricing experts with all levels of expertise could learn, both from the content and from each other.

The scope of the project included the following deliverables:

- Integrated list of the community members (aligned with the regional pricing teams): The setup of different regions varies, and not all Market Organizations have a person dedicated to pricing, thus the need for alignment on who needs to be part of the community.
- Definition of the content for the community: Agreement on which topics within pricing need to be covered in the community, which level of detail, and for which tools training is provided.
- Creation of a first wave of content, focused on the launch of PMT and PAM (expected in September 2018)
- Design of a layout for the pricing Fuse community: Define how the community is structured, decide on the creation of learning plans for certain user groups, define the look and feel of the community.
- (Re-)Launch of the Global Pricing Fuse community: Even though the community already existed and some pricing experts were part of it already, officially launching

the community for all its members with the newly-created content. The launch of the community was set for the 8th of June.

5.1.1. Outcome of the Project

The community was launched on the 8th of June. Around 60 pricing experts, from all the regions, where part of it, 30 of them having a tailored learning plan assigned to them. 70 content items had been created of the 80 content items planned. Most of the content items were videos recorded explaining high-level concepts, and web-based trainings to learn how to use the new pricing tools for agreement review, PMT and PAM. Figure 5.1 shows the community homepage after launch. Figure 5.2 shows the usage of the community during the month of June. The community had an average of 60 views of content per date, and interactions (likes, comments, shares) were still not common but starting to take off.

Even though the project reached the expectations and was deemed successful, there were some roadblocks along the project that hampered the completion of deliverables of the project. In terms of content, the community of pricing experts from mature Hubs committed to create the content about the most high-level topics. However, at the time of launch only 30% of the high-level content planned had been created. In terms of commitment to use the platform, the initial intention was that the majority of the pricing experts from the MOs would follow a learning plan and go through all the training material about a new tool during the month of June. The MO pricing experts from mature regions were going to have trainings for the tool in July, and the aim was that the material in Fuse was a pre-requirement, but this mandate never materialized. Finally, the training material created for the new tool was expected to be needed with the launch of the tool, and when this tool's launch was postponed it meant that the training was not as relevant anymore to the pricing experts.

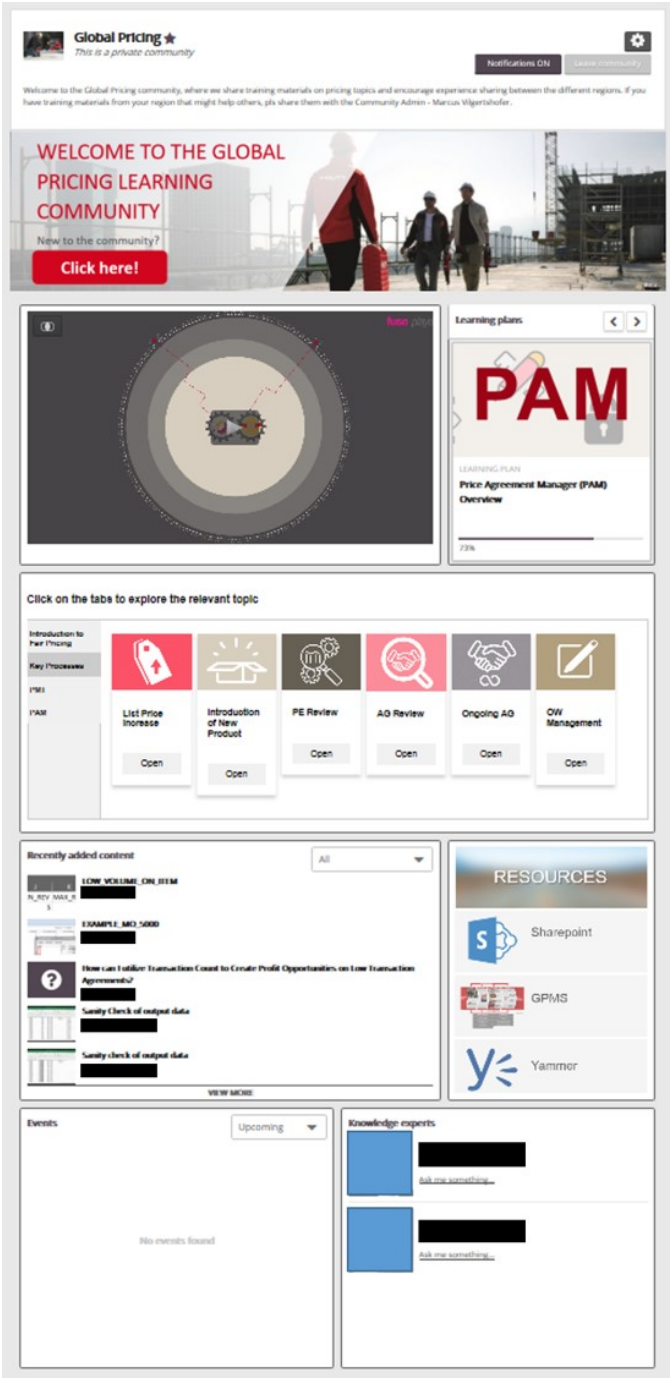

Figure 5.1: Screenshot of the Global Pricing fuse community homepage.

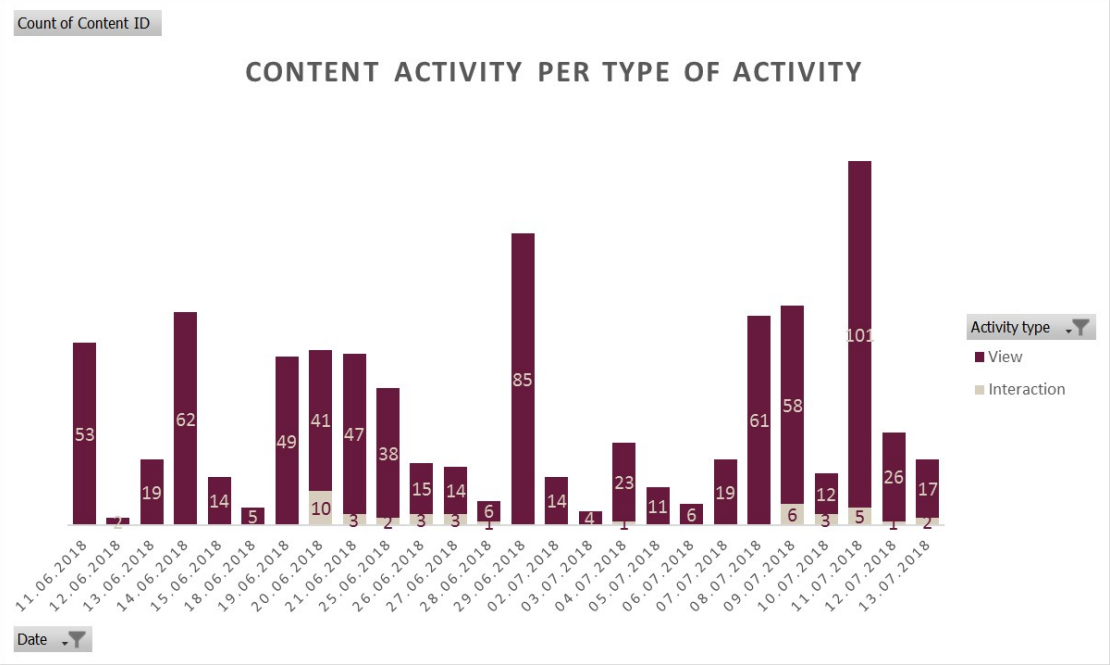

Figure 5.2: Number of views and interactions (like, comment, share) per day since introduction of Global Pricing Fuse Community (excluding weekends).

5.2. Results

5.2.1. Respondents

The sample of participants was composed of 9 pricing experts from Market Organizations, 7 interviews to HUB pricing teams, and 4 interviews to Fuse Experts in Hilti. Among the local pricing experts, 4 where very experienced in their roles (more than 5 years in the role), 2 had medium experience (1-5 years in the role) and 3 were new to their role (less than 1 year in the role). Among the Hub pricing experts, 5 interviews were individual and 2 were to the whole pricing team. The pricing experts (both from HUBs and from MOs) came from all the regions of Hilti's business: 2 from E1, 4 from E2, 2 from E3, 1 from EE, 1 from W1, 2 from W2, 2 from A1, 1 from A2, 1 from META. Therefore, 9 were from Mature Regions and 7 from Emerging Regions. The interviews with pricing experts were recorded and transcribed.

The interviews with Learning and Development professionals were not recorded, but the meeting notes were available for analysis. 2 L&D professionals were from the L&D global team, one very experienced (over 10 years in the role) and one new to the role (less than a year). One interview was made to the regional L&D manager for E1. Finally, one interview was made to the community manager of the Global Finance Business Partner Fuse community, a success case within Hilti for Fuse.

5.2.2. Content Analysis

For the remaining of the Chapter, the results of the content analysis are presented. First, basic analysis are performed to the quotes coded from the interviews. Second, the results regarding the factors within a dimension of the model are presented, including factors that were not part of the original model, but that were highlighted in the interviews. The results presented will be discussed in Chapter 6. The transcript of the interviews can be found in Appendix B, and a summary of all the quotes related to each factor is available in Appendix A.

Basic Analysis

The coding scheme used matched the factors and dimensions from the model developed in Chapter 3. Additional codes where used to register remarks and quotes that were not possible to classify within the model. Their reference count, in Table 5.1, concerns the number of times that the sources were coded into that specific node. The number of references range from 1 (Platform flexibility) to 15 (Way of learning and Role Characteristics) and illustrates the respondent's focus on certain factors.

The recurrence of each factor for each group of respondents is depicted in Tables A.17, A.18, A.19, A.20 in Appendix A. To compensate the different group sizes, the results are shown in percentage of respondents from each group that referred to a factor.

Table 5.1: Number of references to each code

Dimension	Factor	References
Content	Content creation strategy	3
	Flexibility	3
	Quality	11
	Way of learning	15
Social	Community management	6
	Individual characteristics	7
	Organizational support	5
	Community engagement	5
Technical	IT ecosystem complexity	6
	Platform complexity	5
	Platform flexibility	1
	Platform quality	4
Other	Blended learning	3
	Scope of content	4
	Community ties	6
	Role Characteristics	15

When the difference between two groups is bigger than 50%, the factor is highlighted in the tables. As it can be seen, there are substantial differences in the percentage of respondents from a group that referred to a factor. These will be further analyzed in the following sections, which present in detail the results for each factor.

Content Dimension

The Pricing Experts were asked about how had they learned about pricing, and which content they would need to have in a platform such as the one being created. The L&D Professionals were asked about which content they thought was more important to have, and how should this content be created. All the factors of the model were identified as critical for the adoption of the platform. Moreover, other factors that had not been included in the model were raised by the respondents: Blended learning and Scope of content. This section provides an overview of the results obtained for each factor within the content dimension.

Content Creation Strategy Three respondents referred to this factor, two pricing experts and one L&D professional. The pricing experts emphasized the importance of peer-created content, as well as to having direct access to the content creator (quotes P9 and P2 of Table A.7). The person from L&D claimed that in the past experience with Fuse they had observed that content created by community members, with support of topic experts had a high acceptance among the community (quote P20 of Table A.7).

Content Flexibility Three respondents referred to the need for content flexibility to ensure adoption of the learning platform. One mentioned that he would like flexibility in the format of the content (videos, documents,…), a second would want flexibility to adapt the content to the context (because of regional differences) and the last one referred to flexibility to change and update the content shared in the platform easily (quotes P7, P16 and P2 of table A.8 respectively).

Content Quality Content quality was one of the most mentioned factors, with 11 quotes. It was also the factor which presented higher difference in percentage of mentions per group. Pricing experts (56% versus 0% of the L&D professionals, Table A.17), from Hubs (86% versus 33% in the MOs, Table A.18), in Emerging regions (86% versus 33% in Mature regions, Table A.19), were the group who put the biggest emphasis in this factor. The respondents emphasized the need for relevant content, since details are key in their role (quotes P8, P16, P1 of Table A.9). Moreover, they mentioned how in other IT systems of Hilti, the content was completely outdated and how it hampered its usage (quote P4 of Table A.9).

Supported Ways of Learning Together with Role Characteristics, this factor was the most mentioned factor in the interviews. It was mentioned specially by the pricing experts (Table A.17). According to their quotes, the pricing experts were emphasizing the fact that they have been learning from their peers, and that the content in the learning platform should capture the information that they would usually get from their peers. In

that sense, the pricing experts also claimed that they would need means to move their current social learning to the community, asking for features such as live chats, and the possibility to ask questions (quotes P9, P5, and P10 from Table A.10).

Blended learning In the definition provided in Table 3.1, support of all ways of learning focuses on supporting formal and informal learning. However, some of the respondents put also emphasis on the need of content that supports the workshops or trainings face-to-face. The mix of traditional methods of teaching (thus, formal learning), combining face-to-face and online teaching is known as ”blended learning” (Noe et al., 2014). For example, respondent P15 claimed:

> *They should learn all the basics from the Fuse platform, and then join a local PE experience exchange.*

Scope of content A factor that had not been identified in the development of the model but that was emphasized by some respondents is the decisions regarding the scope of the content. As highlighted by the respondents, the decision on which content is included and which content is left out affects the users' adoption of the platform. Some respondents (such as P8 in Table A.11) believed that the scope of content should be broad, including contextual information not directly related to the learning needs of the users. Similarly, respondent P13 claimed that local content, despite the risk of creating confusion, should be in the platform:

> *For me, I would like to have in Fuse the practices from other MOs. I understand you want only global standards, but some best practices would be useful. - P13*

Social Dimension

For the factors within the social dimension, respondents were asked what did they think that the community needed, besides its content, and how could engagement be actively steered. Moreover, the pricing experts where asked whether their individual characteristics and the organization could affect their usage of the platform, and how. All the factors present in the original model were mentioned by the interviewees as important for adoption, without great differences in the percentage or respondents highlighting each factor in any group. During the interviews, two factors that had not been considered emerged: the individual's role characteristics, and the relationships among the community members outside of the platform.

Community Engagement This factor was highlighted by experienced pricing experts that acknowledged that they would need an incentive to actively participate in the platform (respondents P3 and P7 in table A.1). L&D professionals also highlighted this factor, and mentioned their previous experience with other communities of learners as an example of which kind of interventions could foster engagement (quotes P20 and P19, Table A.1).

Community Management Some of the respondents mentioned the usefulness of having a person responsible for managing the community. Specifically, respondent P9 highlighted the need for a moderator that would "ensure the quality of the answers" of peer-to-peer conversations within the platform (Table A.2). A L&D professional commented how, in the case of Fuse and Hilti, assigning "champions" is part of the process of creating a community (Table A.2, respondent P17).

Individual Characteristics Four different pricing experts mentioned some individual characteristics that they held that affected their usage of e-learning tools in general, mainly their years of experience and the region where they were (Table A.3). The im-

portance of the location of the user was also highlighted by an L&D professional, based on her past experience with other Fuse communities (quote P18 in Table A.3).

Organizational Support The quotes coded as ”organizational support” cover the processes and structures of the organization, and how these can affect the adoption of the learning platform. For instance, P2 mentions that a change in the organizational structure of the department makes this learning community more necessary (Table A.4). P7 mentions the culture of the company, explaining that the company is ”very good at launching something, but not at supporting it and explaining it” (Table A.4), as a problem for the learning platform.

Role Characteristics Respondents gave importance not only to the individual characteristics of the user, but more specially to the characteristics of their role and responsibilities as a factor that influences adoption.

> *META, in the hub level, we only work in concepts and tools [...] not comparable to the MO level, where [...] the job is operational. The person joining the Hub needs to have a proper handover and knowledge transfer, [...]. - P5*

Community Ties Besides the management of the community within the platform, the respondents also gave importance to the ties in the community outside of the platform as an important factor.

> *They were lucky that people with knowledge were still in this office. If this person had left the office or Hilti, we would have had a big problem. - P16*

Technical Dimension

The number of references to factors within the technical dimension was the lowest among the three dimensions (Table 5.1). Most of the references to factors within the

technical dimension are from interviews with L&D professionals (Table A.17), and only a few Pricing Expert mentioned these factors. Moreover, no additional factors emerged from the interviews.

IT Ecosystem This factor was specially mentioned by pricing experts with a medium level of experience, between 1 and 5 years of experience (Table A.20). These respondents emphasized the challenges that they find in understanding where can they find what they need across the many IT systems that Hilti has in place (quotes P11, P2, P7, in table A.13). For instance P7 claims the following:

> *We have too many different platforms where we share something, and at the end people who are not really confident with these, do not know where to find something*

Platform Complexity This factor was mentioned by most of the L&D professionals, a much higher percentage than for Pricing Experts (Table A.17). The two pricing experts who mentioned this factor claimed that a platform that was too complicated to use would hamper the usage of the platform. More specifically, they claimed that they would want to be able to find the content they were looking for easily (respondents P9 and P11 in table A.14). The L&D experts, based on their previous experience, mentioned features of fuse that made it more complicated, but that still had to be implemented (P17 and P20, Table A.14).

Platform Flexibility This factor was only mentioned by one respondent, who was part of the L&D team. According to this respondent (respondent P20, table A.15), the functionalities of Fuse (discussed in detail in Annex C) had allowed her to support very different goals within the same community (on-board new employees and support the performance of experienced employees).

Platform Quality As it is the case for the other technical factors, Platform Quality was mentioned more often by L&D professionals than by Pricing Experts (Table A.17). Two of the L&D professionals mentioned that, based on their past experience, the Fuse platform had some quality issues (P20 and P17 in table A.16). The other L&D professional mentioned a feature that increases the ability of Fuse to offer relevant content to the user (P18 in table A.16).

6

Discussion

In this chapter, the results obtained in the exploratory case study are discussed. The discussion is divided in two sections: Revision of the model created in Chapter 3 and identification and reconciliation of dilemmas in the adoption of a learning platform. In the first section, the results from the content analysis of the interviews carried out at Hilti AG are applied to the model developed in Chapter 3. In this way, the model is enriched with the experience of a real case and the insight from its future users. In the second section, the literature about the adoption of learning platforms is confronted with the experience of introducing the learning platform at Hilti AG, revealing the existence of dilemmas between the factors that influence the adoption of learning platforms. How these dilemmas can be reconciled is then discussed

6.1. Revision of the model for adoption of learning platforms

6.1.1. Content

Two of the most referenced factors in the interviews belong to the content dimension (Content Quality and Way of learning). The interviews confirmed that the content creation strategy, the quality of the content, the flexibility of the content, and the ways of learning supported by the content have an impact in the adoption of the learning platform. Through the interviews, a new factor was detected, "Content Scope". The need of the content to facilitate blended learning was detected through the interviews and it was included within the factor "Supported ways of learning", which had been initially defined as supporting both formal and informal learning.

Content Creation Strategy The interviews confirmed the importance of this factor. According to the interviewees, peer-created content positively influences the adoption of the platform (Section 5.2.2), a claim also found in the literature (Miranda et al., 2014; Shah, 2012). Distributed content creation, with content created by other peers has higher acceptance (quote P20 in Table A.7), and facilitates that the content remains updated (Shah, 2012), even though it may hamper adoption if it is not reliable (Pei-Yee-Chin et al., 2015). From the discussion of the findings, the following proposition is stated: *"Peer-created content will increase the adoption of a learning platform, when it is perceived as reliable" (Proposition 1)*.

Content Flexibility The literature had highlighted the importance of having flexible content that could be updated easily. Content easily updated was also mentioned by the interviewees, confirming the importance of content flexibility. Besides easily updated content, the interviewees claimed that content also had to be flexible in terms of personalization, adapted to the context of the learned and the users' individual preferences (Section 5.2.2). Therefore, *"Content flexible to the user's context, individual prefer-*

ences, and dynamic business environment will increase the adoption of a learning platform"(Proposition 2) is proposed.

Content Quality The literature had mentioned that high-quality content needs to deliver value and meet the expectations of the audience. The importance of delivering value was also highlighted by the interviewees, that claimed that the content in the learning platform should be relevant (respondents P8, P16 and P1 of Table A.9). The importance of meeting the expectations of the audience aesthetically and in terms of richness did not emerge in the interviews, even though it had been mentioned in the literature regarding e-Learning 3.0 (Miranda et al., 2014). Therefore, the proposition that can be inferred from this study is limited to the importance of the relevance of the content: *"The presence of relevant content, not outdated, will increase the adoption of a learning platform" (Proposition 3)*.

Supported Ways of Learning The change of the scope of workplace learning detected in the literature review from formal learning to formal and informal learning triggered the consideration of this factor. According to the literature, companies are acknowledging that informal learning is key for the development of their workforce, and that it can be supported by IT. The findings confirmed the importance of supporting informal learning through the learning platform (Section 5.2.2). However, the focus of the respondents was broader. Besides the dichotomy formal-informal learning, the findings also highlighted that a learning platform should support combinations of online and face-to-face learning (respondent P15 from table A.12), a concept known as blended learning (Noe et al., 2014). How the learning activities within the Learning Platform blend with face-to-face learning interventions has an influence on the adoption of the platform. Therefore, the following proposition is stated: *"Content that supports formal and informal learning and blends with face-to-face learning will positively impact the adoption of a learning platform" (Proposition 4)*.

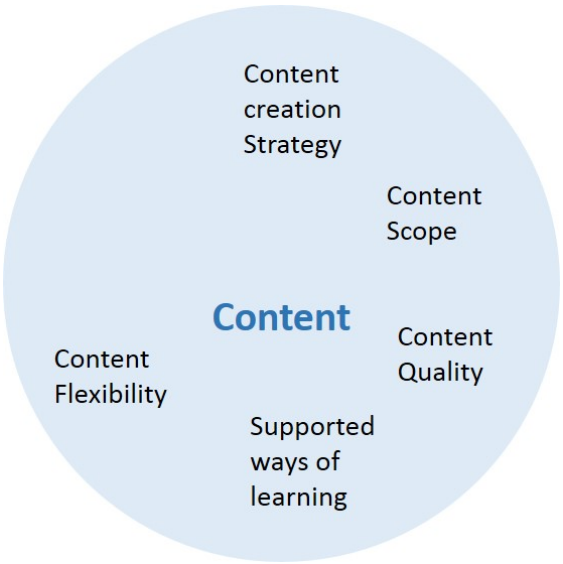

Figure 6.1: Factors belonging to the content dimension of the model for the adoption of learning platform, revised.

Content Scope Pricing experts often brought up their interest in being able to see what their peers were doing in terms of tool creation. Pricing experts often need to create automated excel spreadsheets to process big bulks of data, to track at which prices products are being sold. This part had initially been considered to be left out of the content, because of its complexity (tools created in one market may not be applicable to different markets, and this can create confusion). From the discussion around this topic, it became clear that alignment in what belongs in the learning platform and what does not is an important factor for the success of the adoption of the learning platform. This factor becomes especially relevant when there are other digital tools within the company (such as an ESN), and without clear distinctions on the scope of each tool there is the risk of duplication and confusion. *"The higher the fit between the scope of the content and the purpose of the content, the more successful the adoption of the learning platform" (Proposition 5)*.

Figure 6.1 shows the modified version of the factors within the content dimension of the model.

6.1.2. Social

After the content analysis of the interviews and meeting notes, modifications are proposed for the factors within the social dimensional factor: Two new factors are added (”Community ties” and ”Role characteristics”) and the factor “Community engagement” is merged with “Community management”. The factors individual characteristics and organizational support are confirmed to have an influence in the adoption of learning platforms.

Community management and Community engagement When coding the content from the interviews, it became apparent that the factors “Community management” and “Community engagement” had significant overlap. The tasks and responsibilities of the community manager include ownership of the mechanisms that encourage active participation in the community. Therefore, the two factors are merged into “Community management”.

The theories built around the acceptance of technology emphasize that besides having a technology that improves the performance of the user and where the effort expectancy is low, social influence and facilitating conditions are critical factors (Venkatesh & Bala, 2008). A community manager’s role is to facilitate the use of the platform, therefore contributing to this last factor. More specifically, literature regarding ESN has identified the importance of a community manager (Pei-Yee-Chin et al., 2015), as someone who drives an maintains the creation of high-quality content and enhances employees’ engagement. The case study confirmed the importance of this factor. Respondents claimed that engagement had to be actively managed (Respondent P19, Table A.1), and that the figure of a community manager could contribute to that goal (Respondents in table A.2). Therefore, the following proposition is stated: *”The presence of a community manager that actively facilitates community engagement will be beneficial to the successful adoption of a learning platform” (Proposition 6)*.

Individual Characteristics The UTAUT considers the User attributes a contextual factor that only has a moderation effect in the adoption of the technology (Venkatesh et al., 2003), while the models studied that were specific to a technology for workplace learning (ESN, Corporate Wiki, e-Learning 3.0) all coincided in highlighting the importance of the individual characteristics of the user (Pei-Yee-Chin et al., 2015; Hussain-Alqahtani, 2014; Miranda et al., 2014). The respondents in the case study also considered their individual characteristics an important factor, emphasizing the influence of experience in the job and location in their usage of the learning platform, as it influenced the usefulness of the platform to them (Table A.3). The statements of the interviewees match thus the UTAUT, where the perceived usefulness of the platform is influenced by the individual attributes of the users (Venkatesh et al., 2003). This results in the following proposition: *"The individual characteristics of the users will influence how useful can the learning platform be to them, thus having an impact in its adoption" (Proposition 7)*.

Organizational Support Organizational support had been highlighted in all the studies reviewed in Chapter 3. Instead, few respondents addressed the importance of this factor, and only P7 in Table A.4 highlighted that an aspect of the culture of the company was likely to hinder the adoption of the platform. Therefore, the factor is supported by extensive literature, and its importance is not contested in the case study. The discussion leads to the following proposition: *"Organizational Support will positively influence the adoption of a learning platform" (Proposition 8)*.

Role characteristics Several pricing experts highlighted that the characteristics of their role, beyond their individual characteristics, would have an impact on their willingness to use the platform. Depending on how time-sensitive their tasks are, or how strategic versus operational, their intention to use the platform varied (P10, P5, P4, P6, P2, P10 in table A.5). This is supported by the literature, where the UTAUT model (Venkatesh et al., 2016) and the factors influencing ESN use (Pei-Yee-Chin et al., 2015) both highlight task

characteristics as an important factor. In the case of the UTAUT model, task attributes is considered a contextual factor with a moderating effect (Venkatesh et al., 2016). This matches what the respondents claimed, as their role characteristics had an impact on the usefulness that the platform could have for them, thus affecting their adoption (P5 from Table A.5). The following proposition is formulated: *"The role and responsibilities of the user will have an influence on the advantage that the user can take from the learning platform, thus influencing the adoption of the learning platform" (Proposition 9).*

Community ties The respondents emphasized how their relationships with other pricing experts fostered or hampered their learning (P16, P10 and P15 in Table A.6). The studies of social networks have shown how the structure of ties within the network influences the diffusion of information and opportunities (Granovetter, 1973). The structure of relationships among the pricing experts outside of the community is thus influencing how diffusion information works among the community. Because the learning platform facilitates informal learning, the presence of strong and weak ties (Granovetter, 1973) among the community members will have an impact on the usage of the platform. It is thus proposed: *"The relationship ties among the users will influence the adoption of the learning platform" (Proposition 10)*.

Figure 6.2 shows the modified version of the factors within the social dimension of the model.

6.1.3. Technical

The technical dimension was the most quoted dimension for the L&D professionals (Table A.17), while it was the least quoted for the Pricing Experts from all the groups (Tables A.18, A.19, A.20). The insight from the pricing experts within the technical dimension focused in the factor IT Ecosystem, (7 out of the 10 quotes about factors within the technical dimension from Pricing Experts referred to the IT Ecosystem). After the

Figure 6.2: Factors belonging to the social dimension of the model for the adoption of learning platform, revised.

content analysis of the interviews and meeting notes, no change is proposed to the factors within the technical dimension.

IT Ecosystem The literature review highlighted that the IT infrastructure of a company influences the adoption of a learning platform. The claims of the respondents matched the insight gathered in the literature review. Respondents P11, P2 and P7 mentioned that a lack of understanding of the IT ecosystem hindered their usage of IT (Table A.13). Not knowing what each platform should be used for, or where should they go to look for information, causes confusion among the users. In terms of the UTAUT, it increases the effort expectancy, since they will have to dedicate more time to navigate through the different IT systems in order to find what they are looking for (Venkatesh et al., 2003). Therefore, the following proposition is stated: *"The higher the complexity of the IT Ecosystem of a company, the greater hindering effect in the adoption of a learning platform" (Proposition 11)*.

Platform Complexity The case study concurred with the literature review in highlighting

platform complexity as an impactful factor. The interviewees focused specifically on the degree of effort to find the content they need, as an indicator of the complexity of the platform (Table A.14). The research reviewed discussed the easiness of use of the platform in a more general way. From the discussion of the findings, the following proposition is stated: *"Platform complexity will have a negative impact in the adoption of a learning platform" (Proposition 12)*.

Platform Flexibility This factor was only mentioned by one respondent, who claimed that different features were needed to support different learners and their goals (Table A.15). In the literature, this factor was widely accepted as impacting the adoption of technologies for workplace learning (ESN and corporate wikis). There is no reason to argue that the negative impact of having limited functionalities would not be transferable to learning platforms, and thus the factor is maintained despite the small number of quotes. It is thus claimed that *"A high degree of platform flexibility will positively influence the adoption of a learning platform" (Proposition 13)*.

Platform Quality This factor was ubiquitous in the literature review, being considered as an influencing factor by the majority of studies. In the interviews, respondents acknowledged how some defects of the learning platform being used at Hilti were not following high quality standards, and were causing problems to usage (P20 in Table A.16). Therefore, the following statement is proposed: *"Issues in the quality of the platform will hinder the adoption of a learning platform" (Proposition 14)*.

6.1.4. Modified model for the adoption of learning platforms

Figure 6.3 depicts the model for the adoption of learning platforms with the changes proposed in this section for the dimensions social and content.

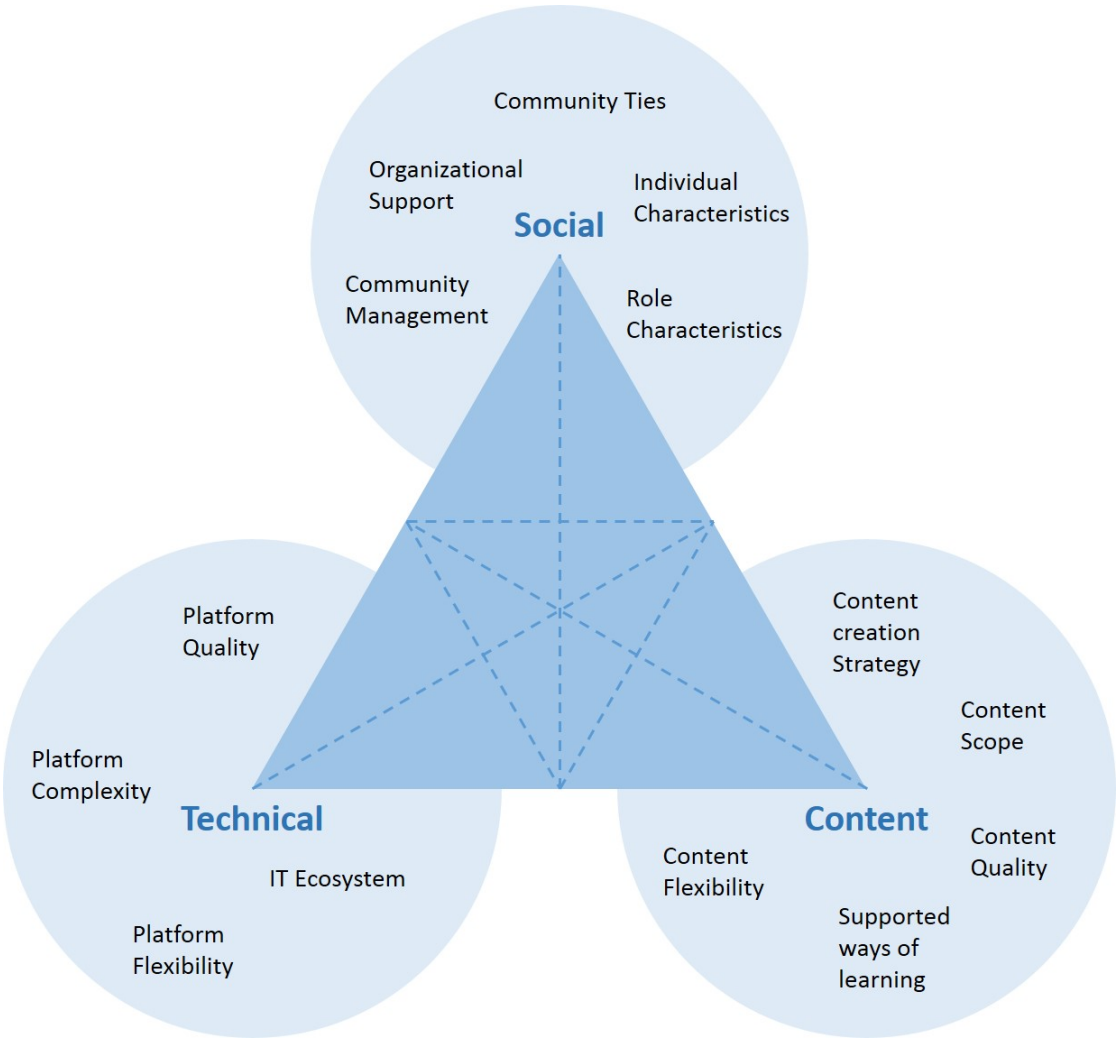

Figure 6.3: Proposed model of factors that influence the adoption of learning platforms in organizations, revised.

6.2. Application of the dilemma-reconciliation method

In this section, the application of the dilemma-reconciliation method to Hilti's case follows. As introduced in Chapter 3, a fourth dimension in the adoption of learning companies goes beyond the three dimensions of content, technical, and social factors, and focuses in the dilemmas that emerge before, during, and after implementation of the learning platform. The dilemmas are classified according to the relationship between

the two extremes of the dilemma: Intra-factor dilemmas, inter-factor and intra-dimension dilemmas, and inter-factor and inter-dimension dilemmas.

To apply the dilemma-reconciliation method, first the dilemmas are identified, the extremes of the dilemmas are acknowledged, and the dilemma-positioning of Hilti in the introduction of their learning platform to the pricing team is discussed. The identification of the dilemmas is supported by the insight gathered in the literature review and from the experience of the introduction of a learning platform in Hilti AG.

6.2.1. Intra-Factor dilemmas

Some of the factors presented in the model imply a dilemma within the factor itself. The factor is argued to influence the adoption of learning platforms, but there is not a clear decision revolving that factor that brings the desired outcome, instead, there is a dilemma between two extremes. This is the case of community management, individual characteristics, platform quality, content quality, and content scope.

Community management

During the introduction of the learning platform at Hilti, the best approach to community management was not clear. Many options were possible, and the tension was between favoring a more top-down or bottom-up approach (Stewart, Manges, & Ward, 2014). In the literature, Pei-Yee-Chin et al. (2015) highlight the role of the community manager in ensuring content quality and appropriate use. However, quality and appropriateness can be ensured through opposite management styles, and the literature does not discuss which approach should be favored.

At Hilti, because of the previous experiences (where learning and collaboration tools had gone unused) the users were expected to have some degree of resistance towards the use of the platform. Hilti's approach to community management was thus a combin-

ation of top-down and bottom-up managerial style. On one side, the pricing managers from the HUBs were involved in the project since the beginning, and they where encouraged to champion the adoption of the platform. On the other side, the pricing managers sent the message that a specific training had to be completed during the month of June, and therefore the rest of the members of the community had an incentive of reputation (Venkatesh & Bala, 2008) to complete the training that was expected from them.

From this experience, the following statement is proposed: *"To enable community management to positively affect the adoption of a learning platform, a company needs to reconcile the dilemma between top-down and bottom-up community management" (Proposition 15)*.

Individual characteristics

During the project at Hilti, it was early detected that the experienced pricing experts were reluctant to use the learning platform. Their expectations about the performance improvement that they could achieve through the usage of the learning platform were limited (P11 in table A.3). This posed a dilemma: How to fulfill the learning needs of unexperienced users while guaranteeing that experienced users are not disengaged? To answer this question, the literature regarding the Technology Acceptance Model provides great insight, since it focuses in the factors that drive an individual to use the platform (Venkatesh & Bala, 2008). According to the UTAUT, performance expectancy, effort expectancy, social influence, and facilitating conditions influence the willingness to use a technology. For the new pricing experts, performance expectancy will play an important role since they need the platform to learn to perform in their jobs. For the experienced pricing experts, if performance expectancy cannot be assumed to be very high, the other three factors may be a way to still foster the experienced users' adoption of the platform.

To improve their willingness to use the platform, the experienced pricing experts were actively involved in the progress of the project, and some were asked to create content. Moreover, they were asked to activate an option of receiving notifications from other users posts in their mailbox, to guarantee that they would be aware of questions being asked and would be able to jump in. The creation of content specific to the experienced pricing experts was left for a later stage due to resource constraints.

From the present discussion it is acknowledged that different individuals perceive different characteristics of the platform as useful. This leads to different triggers of the adoption of the platform for different user groups. Therefore, the following statement is proposed: *"To reconcile the expectations of different user groups, a company needs to tap into different sources of engagement" (Proposition 16)*.

Platform quality

In Hilti's case, an agile approach was taken for the implementation of the platform (Respondent P17 in table A.16). The concept of "Minimum Viable Product" (Lenarduzzi & Taibi, 2016), was adopted as the threshold for launching. At the time of launch not all the content was available, the layout of the platform still had some defects, and the platform was experiencing some bugs. Still, the preferred approach was to be fast in launching, in order to learn fast from the mistakes and improve iteratively. An important bug with the links to the training (which made them less visible) may have hindered the usage of the trainings available through links, and an important bug in email notifications may have hindered access to the platform through the email notifications.

While the literature highlights the importance of quality, it does not specifically address the tension between performance and agility. A defect-less platform may require an excessive amount of resources. The platform may end up obsolete before being active, also hindering its quality. There is thus a dilemma between the risk of insufficient

quality and the risk of obsolescence. The literature about the adoption of learning platforms focuses in easiness to use (Miranda et al., 2014; Pei-Yee-Chin et al., 2015) and low degree of effort to use it and learn to use it (Hussain-Alqahtani, 2014; Venkatesh et al., 2003), not providing guidance on how to solve the dilemma. From the experience at Hilti, the following statement is proposed: *"Seeking to introduce a Minimum Viable Product will foster the reconciliation of a company's quality dilemma regarding the introduction of a learning platform" (Proposition 17)*.

Content quality

In Hilti's case, it was acknowledged that the content is quickly getting outdated (P4 in table A.9), since pricing teams have many tools being developed and the global strategy is updated (but not completely changed) often. Moreover, the Finance Business Partner community, a best practice within Hilti's learning platform, had observed that user-generated content was better received than professional content (P20 in table A.7). Therefore, the decision was to create content fast, that could be used and thrown away quickly. This had the risk that a user would have a series of bad experiences with the content quality and stop using the learning platform.

Equivalent to platform quality, content quality also has a dilemma on which quality is considered enough, balancing up-to-date and completeness. The emphasis in the literature is set on the relevance of content (Pei-Yee-Chin et al., 2015), supporting the decision that was made in Hilti. Therefore, the following statement is made: *"To ensure quality of content, a company will need to reconcile the need for up-to-date content and rich content, focusing on maximizing relevance" (Proposition 18)*.

Content scope

In the literature review it was emphasized that the scope of learning has changed (Arets et al., 2015). Learning in the workplace has expanded from the ”training delivery” to ”performance support” (R. Bates, 2005), and informal learning has gained momentum (de Grip, 2015; R. Cross, 2004). Workplace learning includes now informal learning, which has implications for the scope of content, that now accommodates new content beyond training material. This expands the scope of content that can be considered for inclusion in the learning platform, with the argument that it supports informal learning. There is thus a dilemma for content scope between narrowing the scope to include only content specifically created with learning purposes, or widening the scope to include all content that may contribute to some learning need.

In terms of content scope, the pricing community mirrored the guidelines for content from previous experiences with Fuse within Hilti. There are strong guidelines on the content, and if a piece of content does not answer a specific need of the users it is not posted. For this reason, also most of the content is created especially for the community, and content created for different purposes is not re-used. Moreover, in the pricing community only content about tools that are globally used is included, and not local tools. This does not necessarily hinder social learning, since it is still encouraged to create content. What is not allowed is to share content created for different purposes, that does not fulfill a specific learning need.

From this experience, the following statement is made: *”Clearly articulating the goal of the content to be created contributes to a successful definition of the content scope” (Proposition 19)*.

6.2.2. Inter-Factor, Intra-Dimension dilemmas

Some factors are part of the same dimension, but seem to be incompatible. This is the case of platform complexity and platform flexibility; platform complexity and IT Ecosystem; content creation strategy and content quality; and content flexibility and content quality.

Platform complexity – platform flexibility

Complexity and flexibility are two contradictory values. On the one hand, the platform needs to be kept simple, so that the degree of effort that the user needs to put in learning to use the platform can be kept low. On the other hand, to fit the needs of a diverse group of user, the platform needs to facilitate personalization, and different features need to be available.

As discussed in Section 3.2.2 of the literature review, the modular design of platforms ensures flexibility without giving away simplicity. In the Fuse platform, any kind of content can be posted, multiple social interactions (asking questions, posting comments, liking posts…) are possible, the layout is highly customizable (HTML-coded widgets can be used instead of the default widgets); but still learning to use the platform is easy.

Therefore, the following statement is proposed: *"The use of a modular design will allow a learning platform to reconcile complexity and flexibility, positively influencing the adoption of the learning platform" (Proposition 20)*.

Platform Complexity - IT Ecosystem

The complexity of the IT ecosystem and the adoption of the other tools that are part of the ecosystem pose a dilemma with the complexity of the platform. In Hilti's case there were many tools available for knowledge sharing, finding documentation, and social

networking, however they were not extensively used. The lack of use of the other tools affected the use of Fuse: For example, since the enterprise social network was not used, the announcements of new tools had no place to be posted, and the learning material for these tools available in Fuse had no place to be announced either. If the learning platform would supersede the functions of the other platforms, the negative impact of the other tools may have been reduced, but the complexity of the platform would have necessarily increased.

According to the literature the learning platform should not have superfluous functionalities that belong in other IT tools (Pei-Yee-Chin et al., 2015). Ensuring that the whole IT ecosystem is well designed and all its components are used becomes key (Hanseth & Lyytinen, 2010). The following proposition is thus stated: *"By ensuring that all the tools within the IT ecosystem of a company are adopted by the users and are fulfilling their aim, the complexity of the learning platform can be reduced" (Proposition 21)*.

Content creation strategy – Content quality

Hilti's learning platform had the possibility of creating both structured and unstructured content (as explained in detail in Annex C). By using both options, it was possible to establish a process to ensure content quality while allowing centralized and decentralized content creation. The content created by users was automatically shared in the space for unstructured content. If that content was good and relevant, users would interact with it and this would signal to the community manager that that content should be added to the structured content. If the content lacked quality, users would interact less with it, and the community manager would assess its quality and decide to not include it in the structured content. Finally, the feature "report" enabled users to report misguiding or erroneous content.

Using a decentralized approach to content creation, with user-generated content, brings uncertainty about the content quality. Users do not know whether the content is reliable, because there is the risk that it has not been validated. The literature shows that when content is user-generated, quality of content is an important factor to determine adoption of the technology (Alali & Salim, 2013), and credibility of the source affects perception of content quality (Pei-Yee-Chin et al., 2015). Moreover, when web 3.0 technologies, such as an intelligent search engine, are used the correct annotation of content is necessary to allow users to find the content (Miranda et al., 2014). On the other hand, a centralized creation of content has a higher risk of content becoming outdated (T. T. Baldwin, Ford, & Blume, 2017), posing also a threat to content quality.

Combining the insight from the literature with the case at Hilti, the following proposition is stated: *"To ensure that the content creation strategy used will not negatively impact content quality, strong validation processes need to be set in place" (Proposition 22)*.

Content flexibility – Content quality

In Hilti's case, the creation of content did not always strive for perfection. For topics that were likely to suffer a lot of change, the topic was ambiguous, and a few ideas were important to enable the community to build up from there, the content was created fast, striving for flexibility more than quality. The media chosen for the content did not require many resources (as for instance professional animations do), and the aim was to detect fast how the content could be improved. For topics that were more stable, more resources were dedicated to the quality of the content.

As it is the case for platform complexity and flexibility, ensuring the content quality while being flexible to ensure that content is kept relevant and up-to-date poses a dilemma. As discussed in the literature review, the trends in workplace learning go to-

wards giving higher importance to informal learning (de Grip, 2015; R. Cross, 2004; Arets et al., 2015), and enabling informal learning requires more flexibility, since the content scope is broaden up to include more than formal training material. Agile development methodologies (Martin, 2013) break down projects into smaller parts and deliver these parts iteratively, to manage unpredictability. Through the agile methodology it is easier to reconcile flexibility and quality, and thus the following statement is proposed: *"By taking an agile approach to content creation, companies can ensure that content flexibility and quality are balanced" (Proposition 23)*.

6.2.3. Inter-Factor, Inter-Dimension dilemmas

The third type of dilemmas involves factors from different dimensions. This is the case for individual characteristics and content scope; supported ways of learning and platform complexity, and platform complexity and individual characteristics.

Individual Characteristics – Content scope

In the project at Hilti, the community of learners had heterogeneous characteristics. The extreme difference in level of experience posed a challenge for the learning platform, as explained in Section 6.2.1. An approach to accommodate the different individual characteristics of the users could have been to create the content that fulfills the learning needs of each individual, despite the limited relevance for other users, but this would expand the content scope, with the disadvantages explained in Section 6.2.1.

At Hilti, the decision was to focus the content on the users that had the more demanding learning needs (the newly hired pricing experts), and ensure that experienced users were also engaged through other means excluding content (appointing knowledge experts, involving them in the creation of content, and others). As mentioned already, the content in the platform was kept globally relevant, and the topics where there was

no global alignment were left outside of scope until the alignment was achieved.

From this experience, the following proposition is stated: *"When the user base of the learning platform is highly heterogeneous, a company will have to delimit which profile of user to focus on in terms of content available" (Proposition 24)*.

Supported ways of learning – Platform complexity

In Hilti's case, the platform had the possibility to create and share all kinds of content, and to socially interact with it and with the community. It also had a search engine to find the content needed easily. To facilitate social learning, it had learning plans that could be assigned to a user to track completion. To facilitate blended learning, events could be created for face-to-face trainings, and the events could have pre-required material to go through on-line before the face to face session. Still, the design of the platform facilitated the user experience, and even though the platform had many features it was not perceived as complex.

Different ways of learning require different features from the platform, and this poses a dilemma between supporting all ways of learning or keeping the complexity of the platform low. Experiential learning will be supported for instance by checklists and decision trees, social learning for instance by sharing videos and forums, and formal learning for instance by compliance modules and presentations (ASTD, 2008). Finally, combinations of online and face-to-face learning can be facilitated in the platform through the creation of events, the requirement of pre-intervention learning, and other means to blend online and off-line (Noe et al., 2014). The examples given of features that a platform would need to support all ways of learning show how the degree of complexity of the platform increases.

As shown in the case of Hilti's learning platform, user-friendly design can overcome the complexity of a platform, allowing it to support all ways of learning with multiple

features. Therefore, the following proposition is stated: *"Companies can reconcile the need for extensive features with the need to reduce the platform's complexity by adopting user-friendly design" (Proposition 25)*.

Platform complexity – Individual characteristics

Different users are more or less technologically savvy, and thus the complexity that they can reach is different (Hussain-Alqahtani, 2014; Miranda et al., 2017; Venkatesh et al., 2016). Deciding which level of complexity to choose also sets a threshold on which level of technology savviness will be required from the user. In the case of Hilti, there was not a high difference between the users' comfort in using digital platforms, and thus the level of complexity of Fuse was adequate for all users. However, trainings about the platform (on top of the material about pricing) were created to ensure that the users would be able to learn how to use the platform if that was not clear to them.

"Users' training to use the platform, and user-friendly design will allow a company to reconcile the need for certain platform complexity with the need of a platform that can be used by users with different technology savviness" (Proposition 26).

7

Conclusions and recommendations

This chapter concludes the Thesis project by providing conclusions and recommendations. First, the research question and sub-questions are summarized as to achieve the aim of the present thesis. Limitations are then presented, followed by a reflection on the scientific, managerial and personal side.

7.1. Summary of the Research Questions

The aim of this Thesis Project has been to achieve a better understanding of why learning platforms often go unused after their introduction, by analyzing which factors influence the success of the implementation of learning platforms, and how the tensions that emerge between these factors play a role. The following main research question was formulated:

> *How does the reconciliation of the underlying dilemmas in the introduction of a learning platform influence its adoption?*

To help answering the main research question and guide the study, three research sub-questions have been formulated. The order of the research sub-questions follows

the development of the thesis. In this section, an answer is provided to each research subquestion.

1. *Which factors influence the adoption of a learning platform in a company?*

This question was answered in the study in two phases. The literature review in Chapter 3 provided an overview of the factors that have been deemed influential in previous literature. The case study in Chapter 5 reviewed the model developed in the literature review and complemented it with insight from the experience at Hilti AG with the introduction of a learning platform.

Because the aim of the study is to understand the adoption of learning platforms specifically, the literature review started by reviewing the field of learning in the workplace. Traditionally, learning in the workplace had focused on formal learning and training, with different degrees of IT integration, shaped by theories about learning from the 20th century. There has been recently a change in the scope of learning in the workplace, that acknowledges that informal learning is also important (if not more) for the development of people in organizations.

This discussion has also affected online learning. E-learning, as the practice for using IT to create learning experiences, has evolved to answer the changes in learning in the workplace. The current Learning Platforms differ from the Learning Management Systems in that their approach aims to be learner centric instead of content centric. Besides organizing, recording and delivering e-learning, new features enabled by the advancement of IT allow the learning platforms to be interactive, social, and mobile.

After providing an understanding of what is a learning platform and how the developments in learning theory and IT have shaped its evolution, the literature review focused in previous research about factors that affect the adoption of learning platforms. First, the literature about technology acceptance highlighted performance expectancy, effort

expectancy, social influence, and facilitating conditions, as factors that affect the intention to use the system and its actual usage. A similar set of factors had been found to affect the adoption of Corporate Wikis, a tool used to collaboratively create an online hypertext system for knowledge management.

Seeking to find factors more specific to the context of online learning, two studies were analyzed: Factors for the adoption of Enterprise Social Networks and for the adoption of e-learning 3.0. In the first case, a socio-technical approach was taken, dividing the factors in the social and technical subsystems. In the second case, two similar dimensions are used (stakeholders and technology), but content is added as a third dimension.

The review of the developments in e-learning was combined with the synthesis of the 4 frameworks studied in Section 3.3 in order to create a model for the adoption of learning platforms. 12 factors were included in the model and grouped into three dimensions: social, technical, and content.

The second phase to answer this research question consisted in a case study. In the context of the introduction of a learning platform to a user group within Hilti AG, the validity of the model was studied. A set of interviews were performed in the company before the introduction of the platform, and content analysis was used to analyze the interviews. As a result from the content analysis, the model was modified, with the factors ”community management” and ”community engagement” being merged into one, and with the addition of ”Content Scope”, ”Role Characteristics”, and ”Network Ties” as new factors to the model.

With the combined insight of the literature review and the case study, the impact of the factors in the adoption of learning platforms is discussed. The outcome of the discussion is shown below:

- Content:
  - Content Creation Strategy: Peer-created content will increase the adoption of a learning platform, when it is perceived as reliable.
  - Content Flexibility: Content flexible to the user's context, individual preferences, and dynamic business environment will increase the adoption of a learning platform.
  - Content Quality: The presence of relevant and up-to-date content will increase the adoption of a learning platform.
  - Supported ways of learning: Content that supports formal and informal learning and blends with face-to-face learning will positively impact the adoption of a learning platform.
  - Content Scope: The higher the fit between the content scope and the purpose of the content, the more successful the adoption of the learning platform.
- Social:
  - Community Management: The presence of a community manager that actively facilitates community engagement will be beneficial to the successful adoption of a learning platform.
  - Individual Characteristics: The individual characteristics of the users will influence how useful can the learning platform be to them, thus having an impact in its adoption.
  - Organizational Support: Organizational support will positively influence the adoption of a learning platform.
  - Role Characteristics: The role and responsibilities of the user will have an influence on the usefulness of the learning platform for the user, thus influencing its adoption.

  - Community ties: The relationship ties among the users influence the adoption of the learning platform.

- Technical:

  - IT Ecosystem: A high degree of complexity in the IT ecosystem will have a negative impact in the adoption of a learning platform.
  - Platform Complexity: Platform complexity will have a negative impact in the adoption of a learning platform.
  - Platform Flexibility: A high degree of platform flexibility will positively influence the adoption of a learning platform.
  - Platform Quality: Issues in the quality of the platform will hinder the adoption of a learning platform.

With the identification of these factors, the first research sub-question is answered.

2. *Which dilemmas emerge in the introduction of a learning platform?*

Dilemma theory argues that dilemmas, as situations where a choice needs to be made between contradictory alternatives, need to be made explicit, since creating awareness about the dilemma offers the potential of looking at the issue from a different angle. The dilemma reconciliation method is proposed to support conscious decision making about the dilemma. Dilemma reconciliation consists in the identification of the main dimension of the dilemma, its two extremes, and the subject's relative position. In the organizational context, the organization is the subject, and by properly reconciling the dilemma it can create synergies.

In the literature review in Chapter 3, three categories of dilemmas are proposed: dilemmas within a factor, dilemmas between factors part of the same dimension, and dilemmas between factors from different dimensions. In Chapter 6, the theory from

the literature review is combined with the findings from the case of Chapter 5. The combination of these two streams leads to the identification of the dilemmas that emerge in the introduction of a learning platform:

- Intra-factor dilemmas:
  - Community management: Dilemma between taking a top-down or bottom-up approach to community management.
  - Individual characteristics: Dilemma caused by the need to serve users with strong differences in individual characteristics.
  - Platform quality: Dilemma between the need to produce content fast to keep it up-to-date and produce content without defects.
  - Content quality: Dilemma between the ensuring agility and ensuring lack of defects.
  - Content Scope: Dilemma between the need to keep content relevant and the need to include all content that may contribute to informal learning.
- Inter-factor, Intra-dimension dilemmas:
  - Platform complexity and platform flexibility: Dilemma between the need to make a platform that is simple but yet flexible
  - Platform complexity and IT Ecosystem: Dilemma between relying in other tools for features that are not core to the learning platform, or include all the features in the platform
  - Content creation strategy and content quality: Dilemma between facilitating the generation of content by the users while ensuring content quality
  - Content flexibility and content quality: Dilemma between having content that can be easily changed and its quality

- Inter-factor, Intra-dimension dilemmas:
  - Individual characteristics and content scope: Dilemma between accommodating the needs of a diverse user group and ensuring an adequate definition of the content scope.
  - Supported ways of learning and platform complexity: Dilemma between including features to support formal, social and experiential learning and keeping the platform simple
  - Platform complexity and individual characteristics: Dilemma between the need for certain platform complexity and the need to include all users in spite of their technology savviness.

3. *How can the dilemmas be reconciled in the introduction of a learning platform?*

The base knowledge about the use of dilemma reconciliation methodology to support decision makers in the introduction of learning platforms was scarce, and for this reason an exploratory approach was chosen.

In the case of Hilti AG, the identification of the dilemmas was key to their resolution. By explicitly dealing with the dilemmas and articulating the different options available, the decision making process was better informed and the decision maker was more aware of the limitations. With the combined insight from the literature and the case study, the dilemma reconciliation method was followed. Bellow is a summary of the results of applying the dilemma reconciliation methods to the adoption of learning platforms. These are propositions that emerge from the exploratory study, and will need to be further tested in the future.

- Intra-factor dilemmas:
  - Community management: To enable community management to positively

affect the adoption of a learning platform, a company needs to reconcile the dilemma between top-down and bottom-up community management.

  - Individual characteristics: To reconcile the expectations of different user groups, a company needs to tap into different sources of engagement.
  - Platform quality: Seeking to introduce a Minimum Viable Product will foster the reconciliation of a company's quality dilemma regarding the introduction of a learning platform.
  - Content quality: To ensure quality of content, a company will need to reconcile the need for up-to-date content and rich content, focusing on maximizing relevance.
  - Content Scope: Clearly articulating the goal of the content to be created contributes to a successful definition of the content scope.

- Inter-factor, Intra-dimension dilemmas:

  - Platform complexity and platform flexibility: The use of a modular design will allow a learning platform to reconcile complexity and flexibility, positively influencing the adoption of the learning platform.
  - Platform complexity and IT Ecosystem: By ensuring that all the tools within the IT ecosystem of a company are adopted and fulfilling their aim, the complexity of the learning platform can be reduced.
  - Content creation strategy and content quality: To ensure that the content creation strategy used will not negatively impact content quality, a strong validation processes need to be set in place.
  - Content flexibility and content quality: By taking an agile approach to content creation, companies can ensure that content flexibility and quality are balanced.

- Inter-factor, Intra-dimension dilemmas:
  - Individual characteristics and content scope: When the user base of the learning platform is highly heterogeneous, a company will have to delimit which profile of user to focus on in terms of content available.
  - Supported ways of learning and platform complexity: Companies can reconcile the need for extensive features with the need to reduce the platform's complexity by adopting user-friendly design.
  - Platform complexity and individual characteristics: Users' training to use the platform, and user-friendly design will allow a company to reconcile the need for certain platform complexity with the need of a platform that can be used by users with different technology savviness.

7.1.1. Answer to the main research question

The dilemmas identified through this study cast light into the challenges of introducing learning platforms at companies. As it was hypothesized at the beginning of this study, knowing which factors affect the introduction of learning platforms is a necessary step in the pursuit of a successful introduction, but is not sufficient. Acknowledging the key factors can still lead to lock-in situations with apparently unsolvable dilemmas. One reason why learning platforms often go unused after their introduction is thus a lack of conscious decision-making regarding the operationalization of these factors. The process of identifying and reconciling the tensions between factors contributes to better informed practitioners, and thus better decisions.

The conclusion of this study is that dilemma-reconciliation in the introduction of a learning platform contributes to its adoption. Identifying and explicitly dealing with dilemmas facilitates the decision-making process of the introduction of learning platforms. It raises awareness on potential threats for adoption that may otherwise go unnoticed, and

helps the decision maker find ways in which the dilemma can be reconciled, creating a win-win situation instead of an unsolvable trade-off.

7.2. Limitations and future research

In its first phase, the limitation of the research lays in the scope of its literature review. As stated in Chapter 3, several fields of research contribute to this topic: Information and Communication Systems, Knowledge Management, Organizational Learning. The literature in these fields is extensive and thus reviewing all the research available for this field would not have been feasible. The approach chosen to perform the literature review, explained in 2.3.1, looked both at key publications in the fields as well as the most recent work, and it allowed the study to be based in a rich background. However, a more extensive review could overcome this limitation and may reveal valuable insight in two directions: New factors not present in the current model, or new trends in the field of workplace learning that can alter the factors highlighted in the current model.

In the exploratory case study, there were limitations related to the pitfalls of qualitative studies, the pitfalls of purposive sampling, and the pitfalls of exploratory case studies. According to (Sekeran & Bougie, 2013), reliability and validity have a different meaning in qualitative research. The categories developed, as the factors from the model for the understanding of the adoption of learning platforms, need to find a balance between reliability and relevance. In qualitative studies reliability is inter-judge reliability, the ability of the categories to enable different ”judges” to classify the qualitative data in the same way. Categories defined broadly have higher inter-judge reliability but less relevance, and thus the need for balance. A limitation of this study is that reliability was not analyzed.

Validity refers to the extent to which the results represent the data accurately and they can be generalized (Sekeran & Bougie, 2013). Triangulation is often used to

achieve validity in qualitative research (Sekeran & Bougie, 2013). In this study, the insight from the interviews is complemented with meeting notes from Learning & Development experts, data from the results of the introduction of the learning platform, and desk research about the case company, increasing the validity of the results. A limitation of the study is that there was no data available of the respondents impressions about the implementation of the platform, which would have given more information about the validity of the model by establishing the extent to which it fulfilled the expectations of the respondents.

In terms of the sampling method chosen, non-probabilistic sampling is less reliable than probabilistic sampling, and thus it limits the results. However, purposive sampling was chosen because of the need to follow the company traditional work-flows: The researcher did not have direct contact with the pricing experts at the beginning of the study, and thus had to rely on the recommendations from co-workers, to get in contact with the Hub pricing experts, and finally with the MO pricing experts through their Hubs. The contact with potential respondents had to be connected to the company hierarchy, and this limits the quality of the sampling process.

Finally, as stated in Chapter 2, case studies have been argued to lack generalization power, and to be easy to bias due to their flexibility. The aim of this study was exploratory, but more descriptive and hypothesis-testing studies are needed now to validate the research developed in this study.

7.3. Reflection

7.3.1. Scientific Reflection

This thesis contributes to the fulfillment of the research gap in adoption of learning platforms. The extensive research in related fields had not translated into a greater under-

standing of the challenges in the introduction of learning platforms. The evolution of the theory about workplace learning had not been incorporated to the study of factors influencing adoption, nor had the advancements in e-learning technologies. The use of the social, technical and content dimensions in the model highlights the importance of balancing the three, and the inclusion of ”support of all ways of learning” as a factor brings focus to the advancements in workplace learning theory.

The incorporation of dilemma theory to the model has special scientific relevance. Research about the factors that influence technology adoption, including learning technologies, has been ubiquitous. However, the emergence of tensions between factors, and its risk to the success of the technology introduction, had not received attention in research. As it is stated in dilemma theory, the acknowledgement of dilemmas is an important step in their resolution. By incorporating the dilemmas to the model, this study contributes to the acknowledgement of the dilemmas, and by discussing how the dilemmas were reconciled in the case of Hilti AG, it shows the potential of the dilemma-reconciliation methodology for the introduction of learning platforms.

7.3.2. Practical and Managerial Relevance

From a practical standpoint, this study improves the awareness around the challenges surrounding the introduction of learning platforms in organizations. The identification of three dimensions of factors highlights the complex nature of the challenge. First, the incorporation of the social dimension underlines that the problem is not solely technical, and that an understanding of the organizational, team and individual level is necessary for the successful introduction of a learning platform. Second, the incorporation of the content level builds from the socio-technical approach to focus in the core of the learning platform: The content that enables the users to learn. By acknowledging the three-fold nature of the problem, companies are better prepared to ensure a successful

implementation.

This study goes one step further by placing the spotlight in the tensions that emerge between the factors. The factors and their categories tell organizations what needs to be set in place to ensure a successful implementation. However, decision makers find themselves in a position where they have contradicting alternatives, and a model which presents the factors without connecting them through dilemmas does not provide guidance for decision-making. The model presented in this study emphasizes the presence of these dilemmas and gives recommendations on how to reconcile the dilemmas. In doing so, this thesis takes a first step in the study of the dilemmas present in the implementation of learning platforms. Managers that want to ensure the successful implementation of a learning platform in their organizations need to analyze the dilemmas explicitly, and this thesis provides guidance for doing so.

7.3.3. Personal Reflection

The thesis is an important step in the career of any master's student. Having the opportunity of carrying out the study at a company such as Hilti AG was beneficial for the personal and professional growth of the author. It certainly makes the process of writing the thesis more demanding, since it needs to be combined with the day to day obligations related to the job, but it also makes it very rewarding, as the author can see the research applied to a real situation.

8

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A

Annex - Highlighted quotes from interview transcripts

Social Dimension

Table A.1: Quotes for ”Community Engagement” - Social Dimension

Dimension: Social. Code: Community engagement	
Respondent	Quote
P20	The community members are the heads of finance (Finance business partners) of all the Market Organizations. Not their bosses, not their employees…this makes a big difference in openness, that's why they have strong community guidelines
P10	I think it would be very useful to have something like the XM2020 for pricing, an Experience Exchange for all the pricing experts worldwide. To see how far each one is, to find out if the questions we are asking are being asked somewhere else.
P3	There certainly has to be an incentive to go, so that we can ran into the questions of less experienced PE and help them solve their doubts.
P19	You need to have the community members engaged, have follow up activities... Have a plan on what's happening after the Go Live
P16	I believe that this community can lead to many interactions between markets, that perhaps there will be a difficult part to share with everyone, but the part of queries is all global.
P7	If I am aware that people share there the queries that they discover then I would certainly look for it.
End of Table	

Table A.2: Quotes for ”Community Management” - Social Dimension

Dimension: Social. Code: Community management	
Respondent	Quote
P9	A moderator could help to ensure the quality of the answers.
P10	I think it would be very useful to have something like the XM2020 for pricing, an Experience Exchange for all the pricing experts worldwide. To see how far each one is, to find out if the questions we are asking are being asked somewhere else.
P16	Personally, I think that, although much of the material¨is not going to be relevant to its function, it would be good if they were part of the community.
P3	So yeah, it will be hard, at the beginning maybe it can be required, and then the conversation is flowing and there is more of a pull to be there.
P5	I think they have to be aware of what’s happening with pricing, but in general projects are managed very top-down for pricing in META
P17	When a community is created, champions are assigned and these champions upload content.
End of Table	

Table A.3: Quotes for ”Individual Characteristics” - Social Dimension

Dimension: Social. Code: Individual Characteristics	
Respondent	Quote
P11	I guess it’s not learning that often now, because we have been through the processes so many times, so I guess it’s only if something changes, or a new topic comes up in pricing
P8	When I arrived 3 years ago I was also new at Hilti, so during the first and second year each day you were learning something new.
P6	But again I’m new in my role, I’m not at 100% level yet, so I have more the luxury to learn.
P11	I don’t probably take much advantage of the learning platforms because I don’t need to.
P5	For a person like me that has already been handling pricing for more than 3 years, I really think that it’s a one-to-one discussion between the MOs and the HUB.
P18	Every region is using social learning in different ways
P8	At the end here in E2 there are many things to do, but there are many things that are already done.
End of Table	

Table A.4: Quotes for ”Organizational Support” - Social Dimension

Dimension: Social. Code: Organizational Support	
Respondent	Quote
P9	Specially with A1, our mission is to standardize. For that knowledge is very important. Not just the knowledge, also the people.
P2	With the move to the new MR structure, a possible risk is that the HUB will focus on the processes of its own region and that the smaller regions will be left behind, so the community building part is very important.
P8	We miss a community where learning is centralized, so you are learning from the people you are meeting day by day and with whom you are learning things, and with the help of the Hub.
P3	That has been a process that takes time, first because the salesforce will not necessarily trust someone that has just started in pricing, so the PE is faced with many different pressures, and he needs to be able to show that he has an understanding also of what makes sense in the business side.
P7	We launch tools, but there is no manual, or no really good explanation on how to use them and that’s something that I find quite frustrating. We are very good at launching something, but not in supporting it and explaining.
P17	When a community is created, champions are assigned and these champions upload content.
End of Table	

Codes not included in the original model

Table A.5: Quotes for ”Role Characteristics” - Social Dimension.

Dimension: Social. Code: Role Characteristics	
Respondent	Quote
P10	They don’t have people fully dedicated to pricing, so they have a different focus in pricing than ours.
P5	META, in the hub level, we only work in concepts and tools, which are very advanced concepts. It is not comparable to the MO level, where the main part of the job is operational. The person joining the Hub needs to have a proper handover and knowledge transfer, or this person while not know how the tools were developed and what’s the concept behind them
P4	For EE, I believe only the PE for EU-EE and me. In CIS, there is no other people that are dedicated to pricing and are responsible of all the regional process for strategic marketing.

Continuation of Table A.5

Respondent	Quote
P2	But at the community level in FUSE it can be open for both, and if the MO wants to approach those issues further, for a matter of personal development. The career path in the region is that Market Reach generalists in the MOs then take positions in the HUB, so if they start showing interest and learning, it is very positive.
P6	I've work with probably 10 different developing MOs over the years. Not from mature regions because they have a tighter connection with the pricing community P14 I acknowledge that the people from E2 Hub know who is in the other Hubs, but the MOs do not actually have a network.
P3	In pricing, sometimes there's no right and wrong, or there are different right options, and this is hard. When you define all the prices for all the year, you need to have an understanding of that.
P12	Since my role is quite project-based, with a goal to update pricing in my MO, there's not a similar role in the other MOs in E1
P6	We don't have a structure in which we are a strategic pricing team working on the strategy. We do strategy to get the pricing set for the year, but for the rest of the time we are dealing with live orders and live AM.
P2	There is a lot of difference because the level of depth they need is very different.
P16	Another complicated thing to handle is that we have different systems. We have countries that work with SAP R3 and one works with ByDesign and the information you get is not the same in one system as in the other.
P10	To be honest, I don't think I even know all the tools that Germany is using, I have just recently discovered some tools that I didn't know that existed, and which are really good. Having the tools that allow us to make the right analysis is really important, if we can't do the right analysis we can't ask the right questions.
P8	In the end, it is very interesting to know what is the approach that each market is using. Each market is different, and there may be very different adaptations in each market of the basic concepts of Fair Pricing at Hilti, and it would be interesting to know.
P5	It will always be a challenge for a new person understand the pricing topics and processes.

End of Table

Table A.6: Quotes for ”Network Ties” - Social Dimension

Dimension: Social. Code: Network Ties	
Respondent	Quote
P14	In my position, I need to contact people from MOs of other regions. I found the names I needed in the Organigram, but I had to look for it myself.
P16	In some cases it was better for us to learn from others in our same situation than from more expert hubs.
P10	I think that MO Switzerland is also asking the same sort of questions for their MO but I'm not close to them, we are not exchanging what we do.
P16	From everything he saw and collected he learned a lot, created a network of contacts, got tools and later implemented them here.
P15	Specially before the A1 team was built in summer 2017, I sometimes contacted other MOs.
P16	They were lucky that people with knowledge were still in this office. If this person had left the office or Hilti, we would have had a big problem.
End of Table	

Content Dimension

Table A.7: Quotes for ”Content Creation Strategy” - Content Dimension

Dimension: Content. Code: Content Creation Strategy	
Respondent	Quote
P9	Also, a tools platform. A lot of tools are created, and they are different in every MO. The best approach would be if this tools could be uploaded and downloaded by other people that then could use them, and ask to the creator if they have any questions.
P20	The content in the community for Finance Business Partners (FBP) is created by the FBP in collaboration with Finance Experts. Their content has higher acceptance that external sources, and we are sure that is Hilti-specific content.
P2	Regarding the community and the learning plan, this is dynamic and will improve with the feedback of the people who use it, it will be something that is alive.
End of Table	

Table A.8: Quotes for ”Content Flexibility” - Content Dimension

Dimension: Content. Code: Content Flexibility	
Respondent	Quote
P7	I always prefer as much as possible. Both are very valuable, with videos in a short time you can jump forward to understand it. If you have a manual you have something in the background to have more documentation.
P16	The problem is that the technical part varies a lot. For example, how to make the settings of the discounts, I asked in Asia and there it's different.
P2	Regarding the community and the learning plan, this is dynamic and will improve with the feedback of the people who use it, it will be something that is alive.
End of Table	

Table A.9: Quotes for ”Content Quality” - Content Dimension

Dimension: Content. Code: Content Quality	
Respondent	Quote
P3	Also, once the price is set up, it's very important for the pricing expert to understand also the business. Pricing is not just numbers. It needs to be able to understand the situation rather than sticking to one situation
P7	But if I know from the start that there is something that can help me I will certainly use it.
P8	The basic functions of a pricing expert seem fundamental, especially considering that there is much disparity depending on the market.
P4	For EE the most important would be the basic knowledge. Frankly speaking, talking about the past, our new pricing experts when they came into this position it was a problem to find the information on how pricing works internally, what's the purpose, what's the pricing engine…
P16	I believe that more than anything the Fair Pricing part, understand what is the strategy of Fair Pricing.
P16	If they could do something to help the person coming in to have clarity about where to get the information and how to use it productively, the system would be very good.
P1	In E2, at least for Fair Pricing, we are quite mature on fair pricing logic at least. What could be interesting would be to produce basic How To's, system oriented. For example, how to download prices using LSMW, it's tricky some times.
P4	The issue is that when I'm trying to find material about a process or strategic topic, it could be that what I find is almost 10 years old and I don't know if it's still relevant or not.

Continuation of table A.9

Respondent	Quote
P4	For global tools we would also need content on how to use them. When I have wanted to learn how to use a global tool, the content has been very hard to find, and it's a quite old content.
End of Table	

Table A.10: Quotes for "Support of all ways of learning" - Content Dimension

Dimension: Content. Code: Support of all ways of learning	
Respondent	Quote
P17	Fuse's strategy is to create Bit-sized content using a 70:20:10 approach. We move away from classroom training and instead of focusing in the salesforce we don't target a specific user-group, it's for all employees.
P5	In fuse, it would be useful to have the "80% most commonly used functions for pricing", and a simple explanation of how to do them. This way the new person would not have to go through hundreds of documents in GPMS.
P7	I did not have the authorization to use PMT so I had to see it while someone else was using it. It's not the same as using it yourself.
P11	I don't think there's anything like a document with "If this happens in an order, it will be possibly because of these reasons" and so on for new people.
P16	In my particular case it meant a lot of trial and error, to start comparing to be able to understand well how something works.
P6	In my personal experience, we are very much getting through the day, and we don't often have an hour to sit down and think how can we do things differently, we are trying to stay above water.
P11	Sometimes if you're told about something and you don't get to do it for a few weeks, it's useful to have something in print that you can go back to and refer to and then because you've discussed it, it makes sense.
P15	I try to find the global materials from GPMS and construct the local process policy in terms of agreements and year-end agreement review.
P10	We had pricing workshops with the E3 community quite regularly. We had sessions for that in which we were asked to create plans beforehand. E3 Hub would show us the different profit opportunities, the models in the tools…I learned to deal with PMT in our workshops.
P2	We would be interested in learning about the particularities of other HUBs because we have learned a lot from other HUBs, from what others do. We had several exchanges with people from E1, EE ... They shared some of their tools with us and that helped us to speed up learning.

Continuation of table A.10

Respondent	Quote
P9	Another thing would be a contact list. Knowing “who-knows-what” would be very useful. I know it because of the connections that I have made, but for some MOs, there can be someone with very good knowledge.
P9	Something that would be also useful is the “social network” functionalities. Someone posts a question, many post a reply, and among those replies there can be very good answers. This functionality would be very important for me, because emails create silos, not everyone knows that the question is being ask, and afterwards not everyone knows the answer. A moderator could help to ensure the quality of the answers.
P16	Global gave us a lot of help, but what was the best way was to learn from others.
P5	If we could make an online community, more people would know about the tools that get developed and this would open the possibility that they were used by more people, and that they fitted the market needs of more regions, so the tool would be stronger.
P10	We had that to a certain extent, but not for everything, and it would have helped a lot. Somewhere where I could post my question and someone could answer that I knew that was a pricing expert as well.

End of Table

Codes not included in the original model

Table A.11: Quotes for ”Scope of Content” - Content Dimension

Dimension: Content. Code: Scope of content	
Respondent	Quote
P5	Third, there’s the people with more experience in the role, that need to develop new concepts and tools, and I think that this third level is better to have in one-to-one conversations between Hubs and with the global process expert.
P13	For me, I would like to have in Fuse the practices from other MOs. I understand you want only global standards, but some best practices would be useful.
P4	But maybe the learning platform is not the place to standardize local tools, but the place to learn about the global tools that get created in the future.
P8	I believe that there should be put all the battery of tools available to the Pricing Expert, and documentation related to prices (at the level of macroeconomic trends).
P16	It is probably best to share the best practices, share how each region does each process.

Continuation of table A.11

Respondent	Quote
P10	I would like to see the current projects that other regions are working on, new tools being developed, to see if we can combine efforts and resources and create synergies.
End of Table	

Table A.12: Quotes for ”Blended Learning” - Content Dimension

Dimension: Content. Code: Support of all ways of learning (Blended learning)	
Respondent	Quote
P15	They should learn all the basics from the Fuse platform, and then join a local PE experience exchange.
P5	The system knowledge required is very high, and even if Fuse would help for that, there would still be a need for knowledge transfer between the pricing expert and the new member.
P19	It’s crucial to connect the digital and the physical worlds.
End of Table	

Technical Dimension

Table A.13: Quotes for ”IT Ecosystem” - Technical Dimension

Dimension: Technical. Code: IT Ecosystem	
Respondent	Quote
P13	Also new releases. I don’t know whether it should be on Fuse, but I would like to know about the new features, maybe announcing the planning and the launch of new features in Yammer, and trainings in Fuse.
P6	We have no idea about what’s GPMS.
P11	GPMS is a bit of a nightmare, I mean, it’s so large and it isn’t always clear where to go to find what you want.
P13	Also new releases. I don’t know whether it should be on Fuse, but I would like to know about the new features, maybe announcing the planning and the launch of new features in Yammer, and trainings in Fuse.
P6	We launch tools, but there is no manual, or no really good explanation on how to use them and that’s something that I find quite frustrating. We are very good at launching something, but not in supporting it and explaining.
P17	When a community is created, champions are assigned and these champions upload content.

Continuation of table A.13

Respondent	Quote
P2	finding the material was hard, knowing from whom to learn ... Many things are documented at the process-level, both local and global, in GPMS, but a platform like that in Fuse would help us.
P7	We have a lot of different platforms where we can maybe learn something, or where information is shared, but the point is also that we have too many different platforms where we share something, and at the end people who are not specially really confident with these, do not know where to find something.
P17	Before Fuse, Hilti used ”Skillport”. Skillport only had e-Learning modules. E-Learning targeted Salespeople.
End of Table	

Table A.14: Quotes for ”Platform Complexity” - Technical Dimension

Dimension: Technical. Code: Platform Complexity	
Respondent	Quote
P19	In Fuse there is a tradeoff between size and content.
P9	It would be helpful to be able to find the information easily. If I search something and I can’t find it easily, I will feel that the tool is not useful and I will not use it.
P11	If you have to spend time trying to look for the stuff you need you kind of lose interest.
P17	In Fuse, first communities were open, now most are secret. When a user logs in, from the SAP details of the user, the user is added to certain communities (location based).
P20	For the FBP community the goal is twofold: Onboard new FBPs (through a learning plan) and Performance support for experienced FBPs (through the search bar). Fuse functionalities allow us to support both goals.
End of Table	

Table A.15: Quotes for ”Platform Flexibility” - Technical Dimension

Dimension: Technical. Code: Platform Flexibility	
Respondent	Quote
P20	For the FBP community the goal is twofold: Onboard new FBPs (through a learning plan) and Performance support for experienced FBPs (through the search bar). Fuse functionalities allow us to support both goals.
End of Table	

Table A.17: Percentage of respondents from each department that referred to each factor

	L&D	Pricing Expert
Content		
Content creation strategy	25%	13%
Flexibility	0%	19%
Quality	0%	56%
Way of learning	25%	81%
Social		
Community management	25%	31%
Individual characteristics	25%	38%
Organizational support	25%	31%
Community engagement	50%	25%
Technical		
IT ecosystem complexity	50%	44%
Platform complexity	75%	13%
Platform flexibility	25%	0%
Platform quality	75%	6%
Others		
Blended learning	25%	13%
Scope of content	0%	38%
Community ties	0%	38%
Role Characteristics	0%	81%

Table A.16: Quotes for ”Platform Quality” - Technical Dimension

Dimension: Technical. Code: Platform Quality	
Respondent	Quote
P20	Our community is not stable yet, and Fuse analytics are very limited, so for now they are not reliable.
P10	I would have wished for a tool or platform with videos and documents for the questions I had, where I could look for info 24/7 and not being dependent on someone else.
P17	Fuse was implemented in Hilti with an Agile approach. Not going for perfection, failing fast and getting better quickly.
P18	To know which content is relevant to the end user, Fuse has a relevance index that is smart. It learns from the behavior of the user, and the more the user does searches, the more the engine know which results to provide.
End of Table	

Recurrence of factors among groups

Table A.18: Percentage of Pricing Experts from each organizational level that referred to each factor

	Pricing Expert	
	Hub	**MO**
Content		
Content creation strategy	29%	0%
Flexibility	29%	11%
Quality	86%	33%
Way of learning	100%	67%
Social		
Community management	43%	22%
Individual characteristics	29%	44%
Organizational support	29%	33%
Community engagement	14%	33%
Technical		
IT ecosystem complexity	43%	44%
Platform complexity	14%	11%
Platform flexibility	0%	0%
Platform quality	0%	11%
Others		
Blended learning	14%	11%
Scope of content	43%	33%
Community ties	43%	33%
Role Characteristics	100%	67%

Table A.19: Percentage of Pricing Experts from each region that referred to each factor

	Pricing Expert	
	Mature Region	**Emerging Region**
Content		
Content creation strategy	0%	29%
Flexibility	11%	29%
Quality	33%	86%
Way of learning	67%	100%
Social		
Community management	11%	57%
Individual characteristics	56%	14%
Organizational support	22%	43%
Community engagement	22%	29%
Technical		
IT ecosystem complexity	67%	14%
Platform complexity	11%	14%
Platform flexibility	0%	0%
Platform quality	11%	0%
Others		
Blended learning	0%	29%
Scope of content	33%	43%
Community ties	22%	57%
Role Characteristics	78%	86%

Table A.20: Percentage of Pricing Experts that referred to each factor, grouped by level of experienced

	Pricing Expert		
	Experienced	**Mixed**	**New**
Content			
Content creation strategy	22%	0%	0%
Flexibility	22%	25%	0%
Quality	67%	75%	0%
Way of learning	89%	75%	67%
Social			
Community management	33%	25%	33%
Individual characteristics	33%	75%	0%
Organizational support	44%	25%	0%
Community engagement	22%	25%	33%
Technical			
IT ecosystem complexity	56%	50%	0%
Platform complexity	22%	0%	0%
Platform flexibility	0%	0%	0%
Platform quality	0%	0%	33%
Others			
Blended learning	11%	25%	0%
Scope of content	44%	25%	33%
Community ties	0%	100%	67%
Role Characteristics	67%	100%	100%

B

Annex - Transcript of interviews

This annex is not available for the public version due to its confidentiality.

C

Annex - Overview of Fuse learning platform

Conceptual basis

Fuse has been build to map against the approach to learning known as ”70:20:10”. This reference model acknowledges that that in the twenty first century, people learn anywhere and at any time, mostly from their work and from others (Arets et al., 2015). It urges learning and development to go beyond structured and formal learning, and connect learning and work together.

According to the videos created by Fuse for Hilti, only accessible to Hilti employees, to achieve success for the core businesses, 5 key concepts are central to Fuse:

- **Mobile First:** Mobile first is about using the devices that people are choosing to use in their everyday lives today. It enables the engagement of the audience wherever they are and whenever. The learning can be contextualized to the learners location and situation. This is particularly powerful for organizations which are not only globally dispersed, but have people in remote locations as well.

The second element is about the way in which people engage with learning. Historically learning happened in classrooms, where learners had to physically get to a particular room and be present only then and there. Moving on with traditional, the classrooms were just replaced with desktop or with laptop computers. With the device in their pocket they can snack on their learning, whenever and wherever they are. Beside from convenience this has shown people are far more likely to learn out of choice, and now people are even learning outside of working hours.

- **Bite-sized content:** The next key concept is how content is created so that it works in the mobile first format, and that is engaging. Specially for a phone screen, video makes sense. People process audio and visual on two different channels in their brain, meaning that the learner gets both audio and video memories, which enhances recall and makes the videos more powerful. Short 2-3 minute videos, with subject-matter experts, non-scripted so that they can speak freely and passionately, all combines to make the learning engaging, effective and everlasting.

- **Blended learning:** Blended learning implies thinking about the toolkit, thinking about all the different elements available when designing learning. It might be face-to-face, online learning modules, elements of communities, different types of assessment; and it's by blending all these elements together, that more effective intervention can be achieved for a particular learning aim.

- **Social learning:** Social learning contributes to open up knowledge silos, ensures that the same questions are not being asked and answered over and over again, and increases the sense of team and community. A company can achieve that by combining the Fuse platform with their services and support in the learning exchange projects. In a learning exchange project, a questionnaire is first distributed to find out who are the knowledge diamonds for each topic, what knowledge needs to be captured, and which communities need to be set up. The seed con-

tent is rapidly captured combining the insight from the knowledge experts with the content creation features of fuse. By sharing the knowledge of the knowledge diamonds in the community, the knowledge diamonds experience a 20% productivity gain because of the time they used to lose answering questions, and also they are now fully recognized for their contributions.

- **Communication strategy:** Historically companies have had it very difficult to track and understand who is really engaged. With a myriad of emails, pieces of paper sent out to every person…they don't know who's read them, who's engaged with them. Using Fuse as a communication platform, gives reason to people to be there every single day. It is paramount to get the engagement, and communications can be the hook.

Structure

According to the videos created by Fuse for Hilti, only available for Hilti employees, more than a learning tool, Fuse can be considered a performance support tool. It allows all the content that has been created, whether that's formal content or social content, to be accessed in the moment, from any device. The way in which Fuse supports each component of the 70:20:10 reference model is the following:

- **Learning by working (70):** How Fuse indexes knowledge, the fact that it is build around a content management system, the browser facility, the pre-emptive searching, are all implemented so that the user can quickly get access to the right bit of knowledge, whether it's a video, a text, or even the document.

- **Learning by working together (20):** Fuse is a leading social learning tool, that could fit alongside formal learning, or could sit independently. Its social learning functionalities (recording videos, posting content or questions, commenting or lik-

ing content…) allow Fuse to be used to capture the organization's knowledge in the moment by using the recording facility in Fuse, or a desktop-based recording software, or maybe recording from a phone, and uploading it into Fuse. If someone has "a great idea inside their head", or a great concept to explain, or just a status update on a project, that's quickly captured in the moment, taking minutes, not hours, and it's shared to people that can get value from it.

- **Formal learning (10):** Fuse has all the functionalities of a traditional Learning Management System but in an evolved way. Fuse also allows the running of traditional SCORM courses, which makes it easy for organizations to migrate from their legacy LMS but still keep that content that they have built and invested in. At the same time, Fuse also allows a new structure of content to be built. It's still structured in a course format, but it can be searched and accessed in a bit sized format, so no longer the user is limited to have to try to find a course and then browse through the course for the right component, now it is possible to search for the bit that is needed at that moment.

Fuse also has features for the tracking, the analytics, and the reporting of its usage at a very granular level. It can be used used purely as a compliance learning tool to cover the organization's formal learning needs.

Topics and learning plans

In Fuse, content can be structured or unstructured. Unstructured content is posted in a community and is searchable through the navigation bar. The community administrator can decide to structure the content by grouping content items into one topic, and grouping different topics into a learning plan, that can then be assigned to users. This is further explained in the following section.

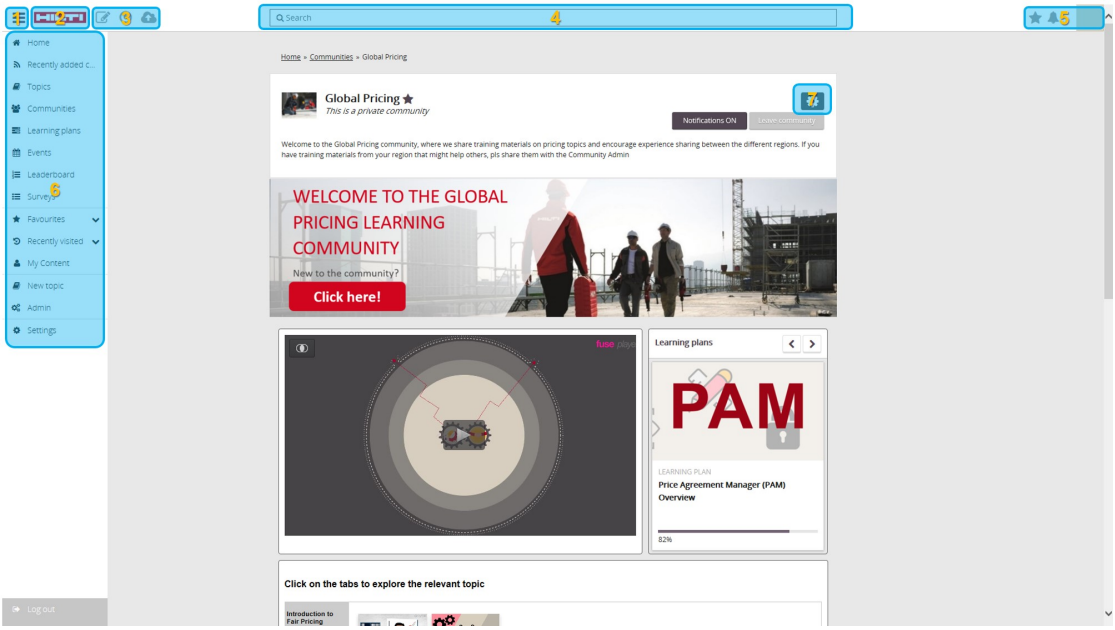

Figure C.1: Screen-shot of the homepage of the community ”Global Pricing”

Layout and features

Because Fuse is highly customizable, in this section the specific layout used at Hilti will be described.

Homepage

In Figure C.1, the homepage of the community ”Global pricing” is shown, and the general features of Fuse are highlighted in blue:

1. **Menu bar:** When clicking in this button, the sidebar (**6**) appears.

2. **Hilti logo:** It brings the user to Hilti’s homepage. Hilti has a different homepage according to the user’s location, and this is automatically synchronized with the user’s profile in the ERP.

3. **Content creation and sharing features:** Through this three buttons, the user

can post (a question, a link, or an article), record, and upload content.

- **Post:** Questions, links and articles can be posted. When posting a question, Fuse asks the user to type the question and a description, add a thumbnail and tags, select the community (or communities) where the question will be posted, and choose to send a notification of the post. To share a link, first the link needs to be added, and then either Fuse populates the other fields with the information from the link, or the user manually fills them. The fields are the same as for questions (title, description, tags, thumbnails, communities, notifications). To post an article, the same fields as for questions and links need to be filled in, but there is also a bucked for the content of the article, which has no character-limit. The user can choose to write in rich text or in HTML language. The pages for posting are shown in Figure C.2.
- **Record:** Fuse has a built-in recording software. It opens after clicking in the record button, and with this software the user can record and edit video, either capturing the screen or with a web camera. After recording and editing the video, the user can upload the video following the same process as to upload files (explained below). The page for recording is shown in Figure C.3, in the left side.
- **Upload:** To upload files, the user drags & drops the selected file, adds file information (title, description, tags, thumbnails, communities, notifications) and posts it. Several file extensions are supported, so they can be viewed within the platform instead of needing to be downloaded. The page for uploading files is shown in Figure C.3, in the right side.

4. **Search bar:** The search bar allows the user to look for content. It is supported by an intelligent search engine, that learns from the user's behavior and recommends content tailored to the user. Figure C.4 shows the window that appears when a

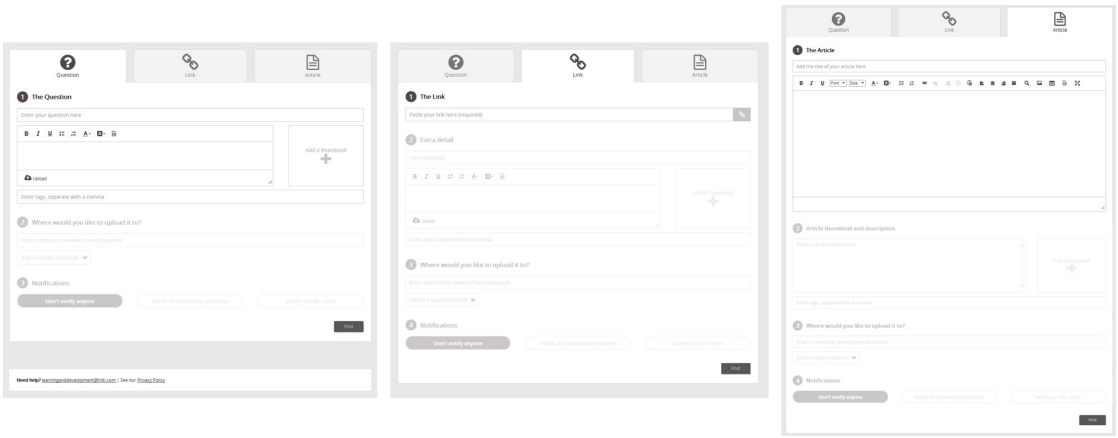

Figure C.2: Page to post questions, links and articles

user searches for content. The content can be sorted by relevance, recent, or popularity. It can be also filtered by type of content (question, event, community…).

5. **Personal features:** The user can ”favorite” content, and then it will be available in the favorites menu (star-shaped). If the user receives notifications, they will be shown in the notifications button (bell-shaped)

6. **Sidebar:** By clicking on the menu button (1), the side bar appears. In the first part of the sidebar, the user has access to content organized in different ways. In the second part, the user can see his or her favorite content, recently visited, or created by him or her. Users that have administration rights can make use of them in the third part of the sidebar. The ”settings” button allows the user to modify settings, such as linking notifications to the email account, changing language, and others.

7. **Administration:** If the user has administrator rights for the community, this button is available and brings the user to the administration page (shown in Figure C.5 and explained below).

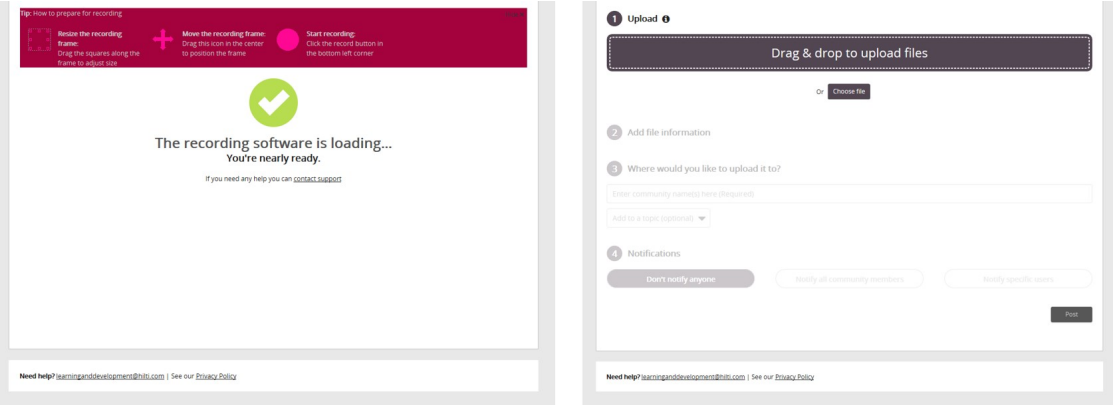

Figure C.3: Pages to record video and upload files

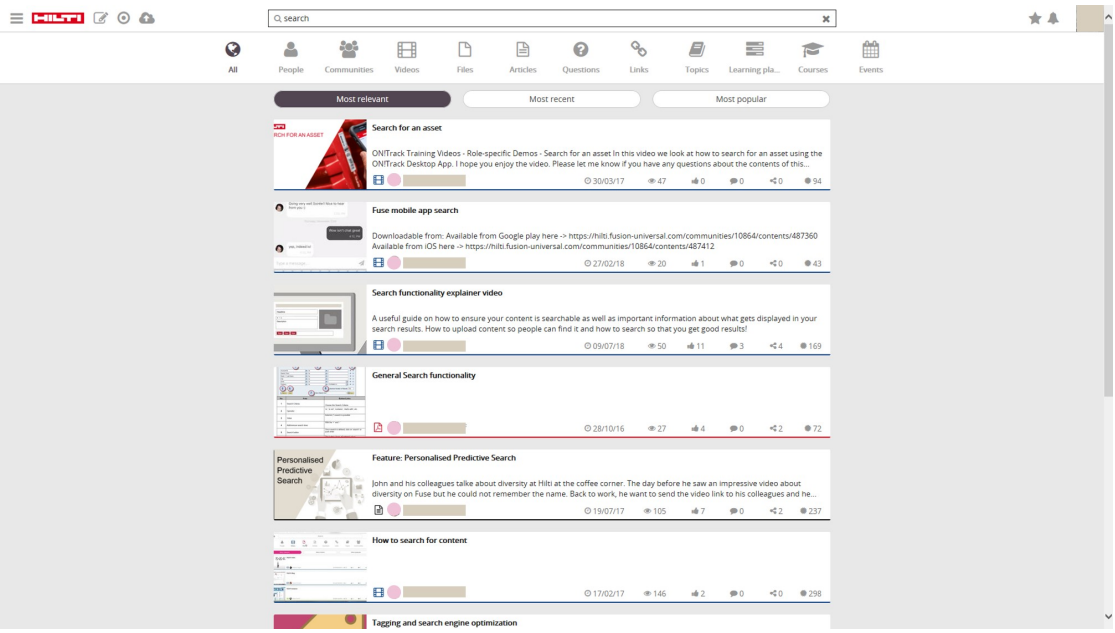

Figure C.4: Search results when looking for ”Search”

Administration page

In Figure C.5, the administration page of the community ”Global pricing” is shown. The page is organized in two sections, the main section, where the administrator can manage the community, and the sidebar, where the administrator can navigate through the administration page. Among the options of the administrator, two require special emphasis:

- **Analytics:** Fuse offers the possibility to analyze the usage and engagement around content. In the analytics page, the administrator can see the number of clicks, views, likes, comments, and shares of the content grouped in type of content, and can export this data for further analysis.
- **Widget layout:** The homepage of each community is entirely customizable. It's organized in columns, and widgets can be added or removed, that have different functionalities. Some widgets show the most recent content added, others a leadership board of the most active users, and many other options. Moreover, besides the default widgets, it is also possible to customize widgets by coding in HTML and CSS. The page to customize the widgets is shown in Figure C.6.

Content

As explained above, content can be structured or unstructured. when the content is part of a topic, it is organized in chapters, as shown in Figure C.7. Each box is a content item, and when clicking on it, the content is shown.

Figure C.8 shows a content item, in this case a video. When opening a content item, a user can see the content (unless it is a link), information about it (when it was published, number of views) and can interact with it. To interact with content, the user can:

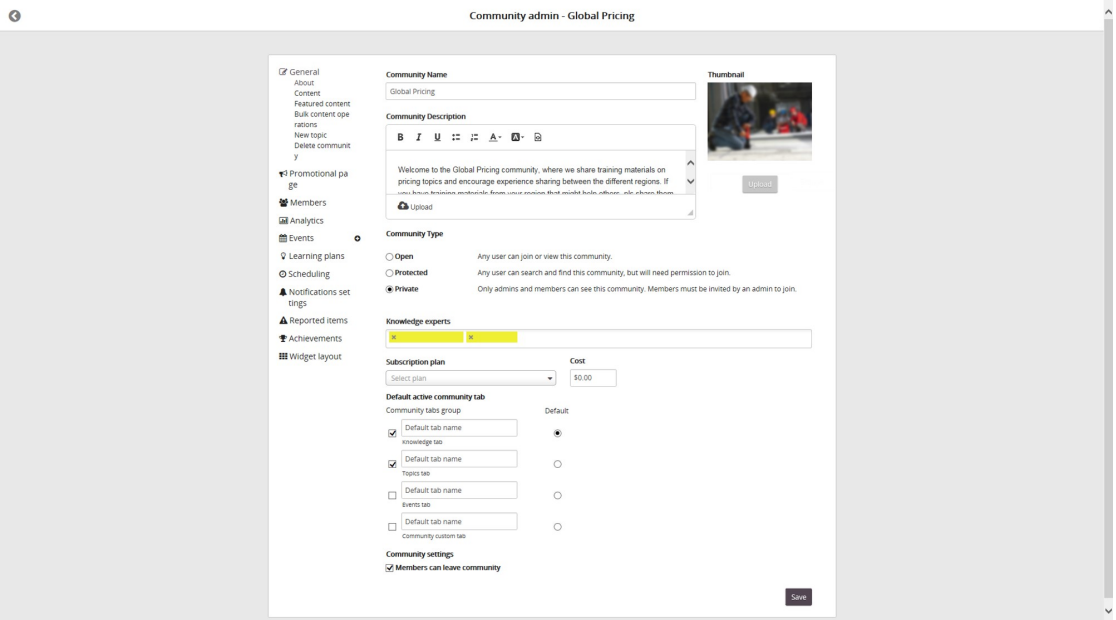

Figure C.5: Page for the administration of a community

- Like the content
- Share the content with specific users or with a community
- Favorite the content to make it easily accessible through the favorites bar
- Report the content
- Post a comment
- Interact with comments that other users have posted

The owner of the content item will be able to see who viewed it, how many times, when, and which percentage of the video they watched (in case of videos).

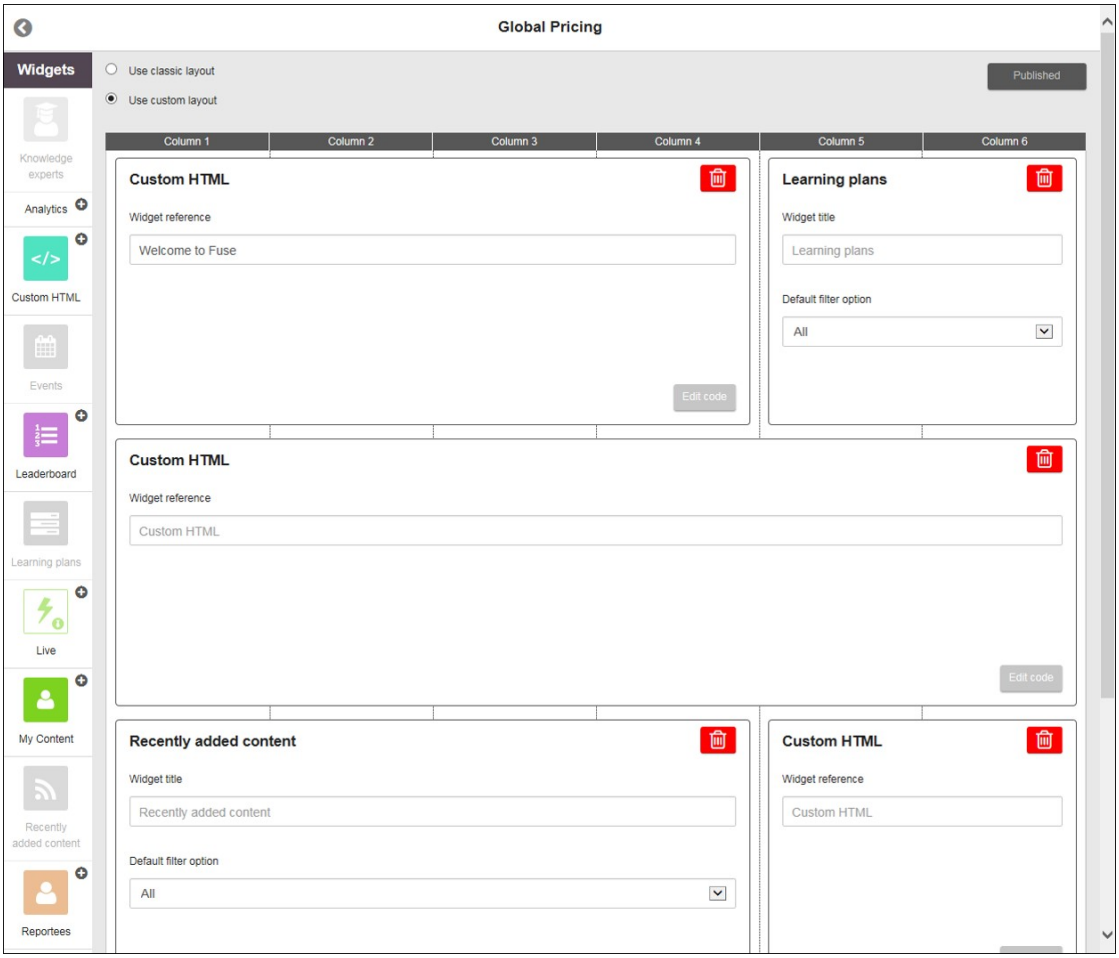

Figure C.6: Page to customize the homepage of a community

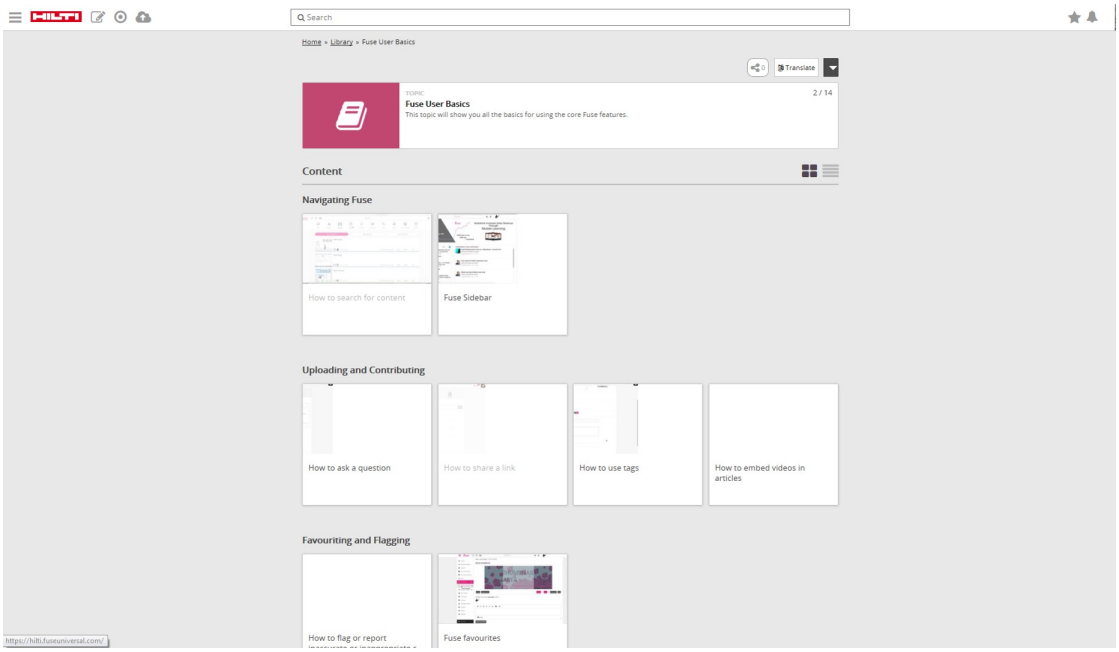

Figure C.7: Page of the topic ”Fuse User Basics”

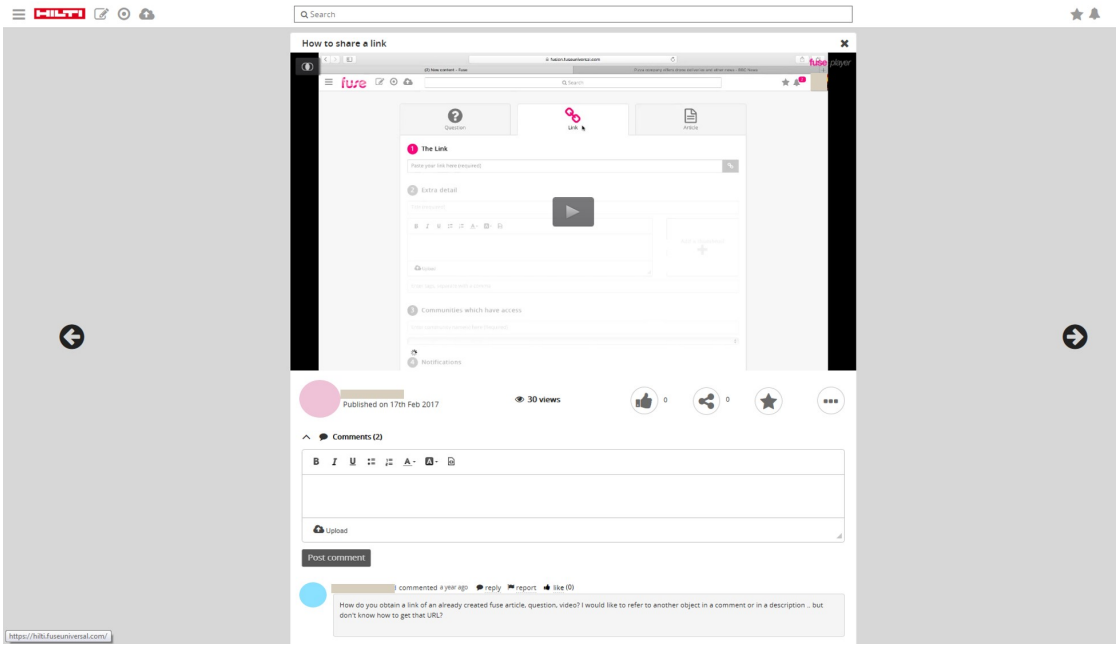

Figure C.8: Pages to record video and upload files