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SOME4PM: A Prescriptive Framework for Guiding Integrated Use of Social Media in Project Management

MIRIAM NAOMI IKEMOTO

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Miriam Naomi Ikemoto

SOME4PM: UM FRAMEWORK PRESCRITIVO PARA GUIAR O USO INTEGRADO DE MÍDIAS SOCIAIS EM GERENCIAMENTO DE PROJETOS

SOME4PM: A PRESCRIPTIVE FRAMEWORK FOR GUIDING INTEGRATED USE OF SOCIAL MEDIA IN PROJECT MANAGEMENT

A dissertation submitted on the Master's Degree Program in Administration with emphasis on Project Management of Nove de Julho University – UNINOVE, as a partial fulfillment for the degree of **Master in Administration**.

Advisor: Professor Rosária de Fátima S. M. Russo, PhD.
Co-advisor: Professor Marcirio Silveira Chaves, PhD.

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MIRIAM NAOMI IKEMOTO

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Presidente: Profa. Dra. Rosária de Fátima Segger Macri Russo – Orientadora, UNINOVE

Membro: Prof. Dr. Marcirio Silveira Chaves – Co-Orientador, PUCRS

Membro: Profa. Dra. Cristina Dai Prá Martens – UNINOVE

Membro: Profa. Dra. Sonia Gantman – PROVIDENCE COLLEGE

DEDICATION

This dissertation is dedicated to my dad and to the memory of my mom whom sacrificed all their lives to give me invaluable education opportunities.

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ABSTRACT

The current competitive environment drives companies to seek solutions to improve the performance of their projects. In this context, the adoption of tools to support the management of these projects is essential. Social media such as wikis, blogs and microblogs, have emerged to present innovative ways to facilitate project management (PM) activities so that they can contribute to the success of the projects. However, companies underexplore the effective integrated use of such tools as a support in PM. Project managers face some challenges, such as lack of knowledge of the tools and, where and how to store data for the effective use of these technologies. **The objective of this research is to develop a prescriptive framework to guide the integrated use of social media to support PM**. This exploratory and qualitative research was conducted under the social constructivist epistemology and hermeneutics. First, I performed a literature review using a hermeneutic approach. As the use of social media in PM is still an emerging theme, there are few empirical studies on the subject. To overcome this problem, I interviewed project managers and I led an exploratory focus group with participants who use social media in their profession. I analyzed the data using Grounded Theory Methodology (GTM) of the Charmaz, a constructivist and the later version of Grounded Theory. Finally, I led a confirmatory focus group to validate the framework. Findings show the understanding of the resources of each social media, along with actions to raise awareness of the use of a common set of tools, represent a powerful instrument for conducting projects in organizations. Four categories of the use of social media were identified: communication, control, dissemination and repository. Considering that most research explores the use of a single tool or their use isolated, this research adds to the literature SOME4PM - a prescriptive framework of integrated use of social media in PM. As a practical contribution, it presents a view of framework contains examples of currently social media to help organizations choice the set of social media that better fit in their needs. Furthermore, it provides scenarios and recommendations for the effective use of SOME4PM in organizations. Hence, project managers have a broad vision on how social media are being used and how they can be integrated to support PM.

Keywords: project management, social media, collaborative tools, web 2.0, grounded theory.

RESUMO

O atual ambiente competitivo leva as empresas a procurarem soluções para melhorar o desempenho de seus projetos. Nesse contexto, a adoção de ferramentas para suportar a gestão desses projetos é essencial. Mídias sociais como wikis, blogues e microblogues, surgiram para apresentar novas formas de facilitar as atividades de gerenciamento de projetos (GP), para que possam contribuir para o sucesso do projeto. No entanto, as empresas subexploram o efetivo uso integrado de tais ferramentas como suporte no GP. Os gerentes de projeto enfrentam alguns desafios, tais como falta de conhecimento das ferramentas e, onde e como armazenar dados para a utilização eficaz destas tecnologias. **O objetivo desta pesquisa é desenvolver um framework prescritivo para orientar o uso integrado de mídias sociais para apoiar o GP**. Esta pesquisa exploratória e qualitativa foi conduzida sob a epistemologia construtivista social e hermenêutica. Primeiro, eu realizei uma revisão de literatura utilizando uma abordagem hermenêutica. Como o uso de mídias sociais no GP ainda é um tema emergente, existem poucos estudos empíricos sobre o assunto. Para superar esse problema, entrevistei gerentes de projetos e realizei um grupo focal exploratório com participantes que usavam mídias sociais em sua profissão. Analisei os dados usando *Grounded Theory Methodology* (GTM) da Escola Charmaz, versão construtivista e mais recente do *Grounded Theory*. Finalmente, realizei um grupo focal confirmatório para validar o framework. Os resultados mostram que o entendimento dos recursos de cada mídia social, juntamente com ações de conscientização do uso de um conjunto comum de ferramentas, representa um instrumento poderoso para a condução de projetos nas organizações. Foram identificadas quatro categorias de uso das mídias sociais: comunicação, controle, disseminação e repositório. Considerando que a maioria das pesquisas explora o uso de uma única ferramenta ou seu uso isolado, esta pesquisa adiciona à literatura o SOME4PM - um framework prescritivo de uso integrado de mídias sociais para GP. Como contribuição prática, apresenta uma visão do framework contendo exemplos de mídias sociais atuais para ajudar as organizações na escolha do conjunto dessas mídias que melhor se encaixa em suas necessidades. Além disso, fornece cenários e recomendações para o uso efetivo do SOME4PM nas organizações. Assim, os gerentes de projeto têm uma visão ampla sobre como as mídias sociais estão sendo usadas e como elas podem ser integradas para apoiar o GP.

Palavras-chave: mídias sociais, ferramentas colaborativas, web 2.0, gerenciamento de projetos, wiki, blog, microblogging.

SUMMARY

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LIST OF ABBREVIATIONS AND ACRONYMS

APM	Association for Project Management
CFG	Confirmatory Focus Group
EFG	Exploratory Focus Group
GT	Grounded Theory
GTM	Grounded Theory Methodology
GP	Gerenciamento de Projetos
ICB	IPMA Competence Baseline
IPMA	International Project Management Association
IT	Information Technology
PM	Project Management
PMI	Project Management Institute
PM 2.0	Project Management 2.0
SOME4PM	Social Media for Project Management

1 INTRODUCTION

Since projects have become continually complex, the concern about the management of these projects is evident. Social media, such as wikis, blogs and microblogs, have emerged to present new ways to facilitate project management (PM) activities so they can contribute to project success. The potential of social media for collaboration and communication in a professional setting has been widely recognized by many organizations and researchers (Filev, 2008). Thus, they can improve existing PM practices. The combination of the capabilities of PM and collaborative tools can create a powerful instrument for agile software development environment (Stober & Hansmann, 2010).

The outsourcing of business processes and services increases the complexity and reduces transparency in organizational structures, activities and processes (Nedbal, 2013). Successful development projects improve time to market, and can enhance competitive position of organizations (Cooke-Davies, 2002). Consequently, the knowledge management has become a priority for organizations and has established the way to keep organizations in the competitive marketplace, continued growth and prosperity for them and all their partners (Wu, 2008). Traditional concepts, methods and systems are unable to meet these needs (Auinger, Nedbal & Hochmeier, 2013).

Social media are being used to support many operating activities in companies. Shang, Li, Wu, and Hou (2011) present a web service model to support the creation of knowledge. Majchrzak, Wagner and Yates (2006) claim the main benefits provided by use a wiki are: 1) the improvement of internal user reputation; 2) the facilitation of activities at work; and 3) the improvement in organizational processes. Along the same line, the use of social media on learning is increasingly being exploited by companies, facilitating learning and communication (Popescu, 2014). Glória, Oliveira and Chaves (2014) recommend the use of social media to support SCRUM processes. However, specifically in PM, few empirical studies have been identified (Duffield & Whitty, 2015; Arazy et al., 2009; Gholami & Murugesan, 2011; Westbrook, 2012; Shang et al., 2011).

Despite the increasing studies of the use of social media, companies underexplore the support that these technologies provide to PM. Most of the studies found in the literature so far report the adoption of a single social media tool or several individual, separate tools (Popescu, 2014). Some barriers in their studies can make difficult the use of these tools, which may be related to (Majchrzak et al., 2006): a) organizational culture; b) lack of knowledge about the use of social media; c) lack of training of employees before its use the tools; d) lack of

communication between employees in PM; e) adequacy of the storage structure of this information (hardware and software); f) difficulty of use of these technologies by senior professionals. Thus, for the effective use of social media, Grudin and Poole (2010) describe the following aspects to be considered in the implementation of social media: a) aligning the expectations of managers and employees; b) organization of content and flexibility to changes of this content over the long term; and c) implement a corporative culture.

1.1 RESEARCH PROBLEM

Contemporary PM requires a set of changes with regard to traditional PM (PM 1.0 henceforward). PM 1.0 is based on centralized planning, decentralized execution and centralized control of projects (Levitt, 2011), which means all responsibilities are centered in the project manager. PM 1.0 is also characterized by the use of tools such as Microsoft Project, Excel and e-mail, which are not focused in collaboration. Although this approach and tools were useful up to the latter half of the 20th century, they have proven costly and ineffective considering the needs of current project managers. Problems inherent to PM 1.0 have been reported in literature. "Traditional PM implies a project manager acting as a proxy in all project-related communications, thus reducing his productivity and therefore curtailing the efficiency of the rest of the project team" (Filev, 2008 p.1). According to Koskela & Howell (2008, p.27) "… in the present big, complex and speedy projects, traditional PM is simply counterproductive; it creates self-inflicted problems that seriously undermine performance." Managers are also often faced with information distributed in a wide range of systems, knowledge bases and repositories. Systems intended to support project managers in such situations are ad hoc, costly to develop, and frequently not used or not used effectively.

To overcome these issues, we are moving to Enterprise 2.0 (McAfee, 2006) since the last decade, requiring a kind of Management 2.0 (Koushik, Birkinshaw, & Crainer, 2009), which leads to PM 2.0 (Levitt, 2011). This new environment brings together around twenty-five great challenges to management (Koushik et al., 2009). At least three of these are strongly related to Management 2.0: *1. Redefine the work of leadership* means that the notion of the leader as a heroic decision maker is untenable. Leaders must be recast as social-systems architects who enable innovation and collaboration; 2. *Expand the scope of employee autonomy* implies the redesign of management systems to facilitate grassroots initiatives and local experimentation; and 3. *Enable communities of passion* means that to maximize employee engagement, management systems must facilitate the formation of self-defining communities

of passion (Koushik et al., 2009). All these challenges of Management 2.0 are in line with the characteristics of Web 2.0 tools, i.e. decentralization of control, bottom-up planning and collaborative environment, among other features (Levitt, 2011).

While Web 2.0 has existed for more than a decade, PM 2.0 is still in its infancy. The little attention that Web 2.0 has had in PM is evidenced in the main PM guides: ICB-IPMA, PRINCE2 and PMBoK. Bentley (2010), IPMA (2006) and PMI (2013) do not refer to Web 2.0 technologies in any of their documentation. On the other hand, the adoption of Web 2.0 technologies by international organizations has been on the increase in recent years (Levy, 2009). Emerging Web 2.0 technologies and applications have started to gain visibility and use by project managers to better support daily tasks and processes (Boulos, Maramba, & Wheeler, 2006; Grace, 2009; Shang et al., 2011). Gholami and Murugesan (2011) detail how the managers of global IT projects are using social media to support everyday tasks and thus improve the management of a project as a whole. Chi (2008) describes how project managers are using blogs and Rich Site Summary (RSS).

The social media environments can represent an opportunity for organizations to introduce more efficient collaboration and increase productivity. Social media can cost-effectively improve corporate performance. The most effective PM is dependent on social media workers in the current dynamic and unpredictable environment of projects. Web 2.0 technologies afford a level of technology-enabled democracy that helps Web 2.0 workers have more autonomy to collaborate in a project.

Team members should push for a more collaborative approach, in which all project documents can be classified under tags or categories in wikis, referenced in blogs and shared via RSS or microblogging. This approach helps to prevent having valuable project documents stuck on one person's hard drive. In addition, Reed and Knight (2010) stress that Web 2.0 tools might be exploited to improve communication on projects regardless of the environment, virtual or co-located.

In fact, empirical evidence of Web 2.0 use within an actual organization is needed, which can benefit management practitioners, who will be able to learn from specific case studies and apply the knowledge learned from them to introduce Web 2.0 tools into their own (Baxter & Connolly, 2013). Considering this lack of empirical evidence of Web 2.0 adoption, use and integration within IT PM, the research question of this dissertation is **How can the integrated use of social media support PM?**

1.2 OBJECTIVES

To answer the research question, the main objective of this research is to **develop a prescriptive framework for guiding the integrated use of social media to support PM**.

The specific objectives of this study aim to:

a) Identify the use and the potential uses of social media in PM;
b) Verify how the social media can be integrated to support PM; and
c) Validate the framework for guiding the integrated use of social media to support PM.

1.3 JUSTIFICATIVE

Since traditional technologies PM 1.0 as video conferencing, web conferencing and even teleconferencing are disabled for the current needs, such as improve of communication speed and updating of information, organization have invested on a regular basis in new technologies to improve your time to market. This growing interest can be seen in the study of Bughin and Manyika (2007). The result of their study shows that three-quarters of executives consider Web 2.0 technology essential to the strategy of their organizations because these tools provide better working conditions.

Some studies have been conducted to demonstrate the potential of social media in organizations. Shang et al. (2011) examined and classified more than a thousand social media from a knowledge-creation perspective. According to them, this kind of tools can be applied in different levels of knowledge so they provide a framework for a better understanding of operating patterns and value propositions within the Web 2.0 paradigm. In the same line, microblogging has been proposed as a platform for knowledge capture instantaneously because of its ubiquitous nature; however, there is a lack of research about whether microblogging would effectively facilitate the creation of quality of knowledge (Cleveland & Ellis, 2013). Social media as blogs, wikis, and other second-generation tools stimulate communication and collaboration. So, they provide an enormous potential for improving existing PM practices (Filev, 2008).

Despite all these initiatives in international organizations in PM, the literature about the scenario of the adoption and use of social media is almost inexistent in Brazil. This fact is one more indicator that it is necessary to provide more effort and investment to support this kind of research in Brazil in order to place our PM at the same level of organizations abroad.

It is also relevant to note that most of the studies found in the literature so far report the adoption of a single social media tool or several individual, separate tools (Popescu, 2014). Creating a theory composed of technologies such as wiki, blog, microblog, and social networking sites and understanding how each Web 2.0 technology can be integrated into this new platform is one of the challenges of this project.

Based on the literature review, the integrated use of social media by project managers is underexplored. Most of the studies found in the literature so far report the adoption of a single social media tool or several individual, separate tools (Popescu, 2014). Moreover, a few empirical studies about the effective use of this kind of tools in PM has been reported (Duffield & Whitty, 2015; Arazy et al., 2009; Gholami & Murugesan, 2011; Westbrook, 2012; Shang et al., 2011). However, some studies relating the use of social media to software development projects using agile methodologies argue these tools improve the communication (Stober & Hansmann, 2010; Lee & Baby, 2013; Levit, 2011; Franky, 2011).

Finally, this dissertation is related to two research projects: "Technologies 2.0 in lessons learned (LL) in project management" supported by CNPq (*Conselho Nacional de Desenvolvimento Científico e Tecnológico*) under the process number 408117/2013-3, and "UTILITY: Use, Adoption and Integration of Web 2.0 Tools in Information Technology Projects", supported by CNPq under the process number 448998/2014-9. The first project was concluded in the first quarter of 2016. First, Rosa, Pedron and Chaves (2016) developed the Target 2.0 model which objective was to propose a model of adoption of Information Technology 2.0 (TI 2.0) to support the management of lessons learned in information technology projects and systems information. Second, three researches, Damasceno and Chaves (2017), Tessi and Chaves (2017), and Winter and Chaves (2017), tested the model through the implementation of three different organizations. The second research project is an extension of the first. The objectives of the UTILITY are twofold: 1. Develop a theoretical approach to integrate Web 2.0 tools for guiding their adoption and use in IT projects; and 2. Validate the theory proposed in IT projects. This dissertation will be cover the item 1 of that project.

1.4 RESEARCH STRUCTURE

This study is organized into seven chapters. Chapter 2 contains the theoretical background that supports this study, it presents the main concepts of traditional PM and PM 2.0, it also presents social media concepts and the results of literature review focus on the use of social media in PM. Chapter 3 presents the research design used for the development of this research

including data collection and data analysis procedures. Chapter 4 presents the analysis of results using GTM. Chapter 5 presents discussions. Chapter 6 presents theoretical and practical contribution and finally, Chapter 7 presents the conclusion, limitations of this research and suggestions for next studies.

2 THEORETICAL BACKGROUND

In this section, two theoretical polos were considered, Project Management and Social Media. First, I present the concepts about PM based on the different authors and best practices guides of traditional PM. Next, I present the main PM 2.0 characteristics. Second, I present the concepts of most popular social media and their use in PM based on a literature review. The delimitation of scope of this research involves the study of social media in PM as presented in Figure 1.

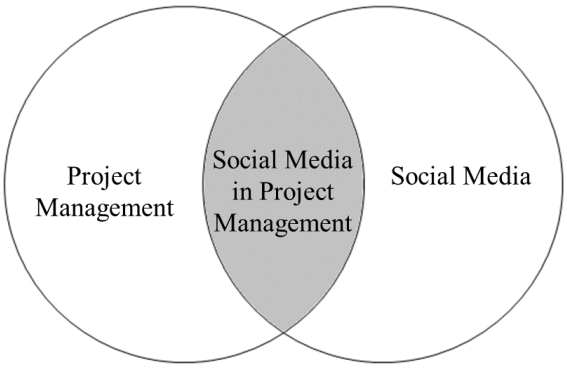

Figure 1: Delimitation of the research.
Source: Author

2.1 TRADITIONAL PROJECT MANAGEMENT

The aim of this theoretical polo is to present the most popular definition about PM, also the characteristics of the main PM best practices guides. Although I present the concepts about PM, this study involves the analysis of the use of social media by the project team as a role, not only by PM.

PM, according ISO 10006 (2000, p. 3), include "planning, organizing, monitoring, controlling and reporting of all aspects of a project and the motivation of all those involved in it to achieve the project objectives". The most popular definition was described by PMI (2013, p. 2): "Project management, is the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements". In complement, "Project management quality is defined as fulfilling the requirements agreed for the management of the project" (IPMA, 2006, p. 2).

In addition, many researchers also defined the term PM: "Project management can be defined as the process of controlling the achievement of the project objectives" (Munns &

Bjeirmi, 1996, p. 81). In the same line, for Shenhar and Dvir (2007, p. 5) “Project management is the set of managerial activities needed to lead a project to a successful end”. For Westland (2007, p. 3) “Project Management is the skills, tools and management processes required to undertake a project successfully”. Finally, “project management can be seen as the sequential application of structured, repeated and continuous processes that, when used by an organization gradually and safely to their business, allows advancing to institutionalize standard practices.” (Patah & Carvalho, 2012, p. 182).

Studies on PM began in the early '50s, when the CPM (Critical Path Method) techniques were created and PERT (Program Evaluation and Review Technique). In 1960 came the first associations in order to regulate and set standards for the project area as the IPMA (International Project Management Association) in Europe and PMI (Project Management Institute) in the United States. In 1970 there was a focus and effort in the development of software to support PM. Then came the first project cycle, covering the 1980s and 1990s, and focused mainly on issues related to project results: deliver the correct scope within and stipulated cost and quality - focus on basic knowledge areas a project. This phase was characterized as the efficiency of the cycle, i.e., how to make sure the project. The second phase, which began in 2000, is characterized as the cycle of effectiveness, i.e. how to do the right project. Thus, the cycle begins to establish guidelines such as strategic alignment, initiative project portfolio creation, search for new PM models and the development of team skills and project manager.

The PMBoK is the most popular PM body of knowledge. PMBoK contains a set of generic methods and comprehensive that aims to meet the needs of various types of PMI projects (2013). The European standard PM published by IPMA, the ICB is a method that focuses in the human aspects of management (IPMA, 2006). The IPMA is structured into three types of skills that the project needs to develop: contextual skills, and behavioral techniques. In addition to these, the Australians created the AIPM (AIPM, 2008) and the English created the APM Body of Knowledge (APM 2006).

The AIPM project guide also focus on the human aspects of PM as ICB (IPMA, 2006). Patah and Carvalho (2012) consider APM (APM 2006) as one of the most complete sets of methods. APM contains in addition to the aspects related to technical PM, content that address the concepts of PM value, models and systematic implementation of project offices and strategic aspects of PM. Another known guide is the PRINCE 2, which is more focused on the information technology market. The PRINCE 2 is structured in stages of a project and activities to be conducted by the same management team, so is more focused on the practical application than the other are. Figure 2 shows a list of PM best practices most used by organizations.

Instititute	Set of Methods	Country of Origin	Methodology Focus
Project Management Institute (PMI)	Project Management Body of Knowledge (PMBoK)	USA	General project management
International Project Management Association (IPMA)	ICB – IPMA Competence Baseline	European Union	Human aspects
Australian Institute of Project Management (AIPM)	AIPM – Professional Competency Standards for Project Management	Australia	Human aspects
Association for Project Management (APM)	APM Body of Knowledge	United Kingdom	General project management
Office of Government Commerce (OGC)	Projects In Controlled Environments (PRINCE2)	United Kingdom	Information systems project management

Figure 2: Main project management associations and the corresponding set of methods.
Source: Adapted by Patah and Carvalho (2012)

2.2 PROJECT MANAGEMENT 2.0 (PM 2.0)

Technological advancement and increased use of social media by organizations transformed the practice of PM. Collaboration and decentralization characterize this new approach. New generation of tools supports both project managers and team members in their daily activities, from communication and knowledge management to managing logistics and performance monitoring. The adoption of Web 2.0 tool allows for creating an environment of collaboration and information. The project managers are not the centralized source of information anymore, and this creates agility for problem solving. This is how introduction of social media in PM facilitates the deployment of the PM 2.0 concept.

PM 2.0 can be defined as "PM 2.0 = PM 1.0 + distributed collaboration", where PM 1.0 is the traditional PM, and distributed collaboration is guided by open communication which thrives on collective intelligence to support decision makers (Kerzner, 2015). According to traditional PM paradigm (PM 1.0), project success is measured by adherence to triple constraint involving scope, time and cost (PMI, 2013). Within this approach, a detailed plan is developed at the beginning of the project, and team members commit to the deliverables indicated by the plan. PM 1.0 enforces complete project documentation, which makes the management process very disciplined. In this context, PM 1.0 is viewed as operational, not strategic, process (Kerzner, 2015).

The triple constraint method focuses on the process based project performance metrics, and ignores the outcome based on metrics such as quality and functionality of the final product (Gopal and Gosain, 2010). In the changing business environment and increased competition, the business value delivered by a project becomes more relevant than the triple constraint.

Business value is the key characteristic of PM 2.0, it is the only justification for project continuation (Kerzner, 2015). PM 2.0 empowers team members through motivation to share global awareness and self-synchronization. Thus, business value is delivered continuously via agile development and interim states. While some companies are struggling with the pains of traditional PM tools and email, others are becoming more efficient and innovative by leveraging the benefits of these technologies (Filev, 2008). Those who have already adopted the new tools feel they are indispensable for the business success (Ibid.).

PM 2.0 changes the unidirectional approach of the process of transmission of knowledge to a bidirectional one, positioning the user as creator and disseminator of information. These new technologies emphasize collaboration and knowledge management within the organization and the projects (Filev, 2008). This new approach to management project is an expansion of traditional PM, altered by globalization, the expansion of the Internet, and the insertion of Web 2.0 information technologies (Levitt, 2011). Therefore, the use of Web 2.0 technologies has facilitated the interpersonal communication, the collaborative work and the change of knowledge between team members (Câmara, Soares, Tessi and Chaves, 2015).

Figure 3 shows the main differences between traditional PM and PM 2.0.

Factor	Traditional PM	PM 2.0
Planning	Centralized	Decentralized
Project requirements	Well defined	Evolving and flexible
Definition of success	Time, cost and scope	Business value created
Scope changes	Minimized	Possible continuous
PM methodologies	Rigid	Flexible
Type of control	Centralized	Decentralized
Type of leadership	Authoritarian	Participative (collaborative)
Overall communications	Localized	Everywhere
Access to information	Localized and restricted	Live, unlimited access and globalized
Communication media	Reports	Dashboards
Software tool complexity	Highly complex tools	Easy-to-use-tools
Type of project team	Collocated	Distributed or virtual
PM culture within firm	Competitive	Cooperative
Organization PM maturity	Optional	Mandatory
Speed of continuous improvement effort	Slow	Rapid

Figure 3: Comparation between PM traditional and PM 2.0
Source: Adapted by Kerzner, 2015

This new perspective of PM brings both advantages and disadvantages. Although PM 2.0 is being implemented and it works for many organization, especially on IT projects, most companies still use traditional PM and get success in their projects (Kerzner, 2015). Even though PM 2.0 focuses on collaboration, there is no guarantee that people will communicate best with others. The communication aspect is a cultural issue of the organization and does not depend only on the availability of tools. Furthermore, the change of PM paradigm takes the professionals out of their comfort zone. This may represent a barrier to implement PM 2.0 in organizations. Despite the barriers, social media became a facilitator of PM 2.0. In this context, the understanding of the use of social media in collaborative and distributed environment will be help us to answer the research question **How can the integrated use of social media support PM?**

2.3 CONCEPTS ON SOCIAL MEDIA

"Social media is a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of User Generated Content" (Kaplan & Haenlein, 2010, p. 61). Web 2.0 tools can be defined as a collection of technologies, business strategies on trends in collaboration tools (eg. blog, wiki, microblogging, Skype, Facebook, Google docs, RSS feeds, bookmarking, mashups) (Gholami & Murugesan, 2011). Web 2.0 tools allow users to interact and collaborate with each other throughout the web, so depends on technology. Tim O´Reilly and Dale Dougherty at the O'Reilly Media Web 2.0 Conference popularized the concept of Web 2.0 in 2004.

Another term related to social media is collaborative tools. The concept of collaborative tool came from both concepts (Lomas, Burke & Page, 2008): a) Collaboration - The action of working with one or more people to produce or create something; and b) Tool - A device or implement used to carry out a particular function. These collaborative tools concept is broader than the concept of Web 2.0 tools, because collaborative tools can be any tool permit collaboration, independently of technology. The terms collaborative tools and social media are used interchangeably in many cases in the literature. In terms of this research, I use the term "social media" because it seems most popular term comparing with the others. Therefore, this term can be found more easily by the scientific community in the future researches.

Social media can be divided into different categories. Safko (2010) divided the social media in fifteen categories. Safko (2010) describe the categories as follow. Figure 4 shows the

categories presented by this author. Each category has a description and a list of corresponding mains tools.

Category	Description	Representative tools
Social networking	Social networking tools allow you to share information about yourself and your interests with friends, professional colleagues, and others. The motivation to join a social network is usually social rather than commercial.	Bebo Facebook Fast Pitch! Friendster Gather.com KickApps LinkedIn MOLI MySpace Ning Orkut Plaxo
Publish	Publishing is a broad category that includes tools that facilitate e-mail campaigns, blogging, and wikis. There are even tools that help you manage your online content.	Blogger.com Constant Contact Joomla Knol SlideShare TypePad Wikia Wikipedia WordPress
Photo sharing	Photo sharing tools manage photos. The ability to archive and share photos may be very valuable to many busines.	Flickr Photobucket Picasa Radar.net SmugMug Twitxr Zooomr
Audio	Corresponding the tools that have ability to download and carry thousands of hours of songs, podcasts, and other programs on a device that slips into a shirt pocket. Some company CEOs send out monthly messages to their workers via a podcast.	iTunes Podbean Podcast.net Rhapsody
Video	This is an important category because most people have been raised with at least one television in the home. That same content can be viewed on your computer or your mobile phone. With video capability on the mobile phone, it is possible capture and share moments and events with others.	Brightcove Google Video Hulu Metacafe Viddler YouTube
Microblogging	Corresponding the ideal tools to communicate something important or meaningful in less than 140 characters.	Plurk Twitter Twitxr WhatsApp (*)
Livecasting	This category encompasses Internet radio and other applications that allow users to stream a live broadcast to an audience or social network. Livecasting offers a flexible means of engaging your audience by educating or entertaining them.	BlogTalkRadio Live 365 Justin.tv SHOUTcast TalkShoe

Category	Description	Representative tools
Virtual Worlds	Corresponding the tools that people can interact with others in a virtual community. Some organizations use a virtual campus where employees can meet with one another to collaborate or conduct training.	Active Worlds Kaneva Second Life There ViOS
Gaming	Gaming and virtual worlds have some things in common, but what sets them apart is the notion of cooperation and competition that is the very basis of gaming.	Entropia Universe EverQuest Halo3 World of Warcraft
Productivity applications	This is a bit of a catch-all category, but the common denominator to all of these tools is that they enhance business productivity in one way or another. Tools in this category are serious business applications.	Acteva AOL BitTorrent Constant Contact Dropbox (*) Eventful Google Alerts Google Docs Google Drive (*) Google Gmail MSGTAG Onedrive (*) ReadNotify Survey Monkey Tiddlywiki Yahoo! Zoho Zoomerang
Aggregators	Tools in this category help users gather, update, and store information for easy access. These can be excellent tools for capturing market intelligence.	Digg FriendFeed Google Reader iGoogle My Yahoo! Reddit Yelp
RSS	RSS is an acronym for Rich Site Summary. The tools in this category automatically feed a current content from the web sites that are most critical to the business needs. It could be an industry blog, statistics posted on a competitor's site, or information from a government agency's web site.	Atom FeedBurner PingShot RSS 2.0
Search	Represent the tools to search something in the internet. Tools like Google permit to find people, places, and things that are interesting. Google has become synonymous with doing an Internet search.	EveryZing Google Search IceRocket MetaTube Redlasso Technorati Yahoo! Search
Mobile	This category focuses on the tools for mobile phones. Many of the tools from other categories in the social media can be accessed via mobile phone, and yet there are specific tools that make the mobile phone a more powerful business ally.	airG AOL Mobile Brightkite CallWave Jott Jumbuck

Category	Description	Representative tools
		SMS.ac
Interpersonal	Tools in this category facilitate people-to-people communication and collaboration.	Acrobat Connect AOL Instant Messenger Go To Meeting Hangout (*) iChat Jott Meebo Skype WhatsApp (*) WebEx

Figure 4: Social media categories
Note: (*) Included by author
Source: Adapted from Safko, L. (2010).

Follow, will be presented some details about the top social media explored in the literature.

2.3.1 Wikis

A wiki is a web-based collaborative authoring system for creating and editing content (Gholami & Murugesan, 2011). In addition to facilitating the collaborative creation of content in PM, Stocker et al. (2012) reports other benefits of wiki usage from a literature review: enhancing reputation, making work easier, helping the organization to improve its processes, facilitating knowledge sharing and creativity, reducing information overload within the enterprise, and the ability to make knowledge work and its output more visible and transparent.

Grace (2009) highlights other advantages in the usage of wikis, including ease of use, central repository for information, tracking and revision feature, collaboration between organizations and solving information overload by e-mail. From the existing types of wikis (semantic wiki, peer-to-peer wiki, personal wiki, corporate wiki, and structured wiki) described by Grace (2009), personal wiki, corporate wiki, and structured wiki seem to be more relevant to IT projects. In personal wikis, users keep it as a form of concept map or journal for an idea. Corporate wiki is mostly used internally in a corporate context as opposed to public wiki on the Internet, while structured wiki combines the benefits of sharing and collaboration of a plain wiki with the structured elements of a database by allowing the structuring of information when needed.

Wikis allow the implementation of the process or task of socially constructed knowledge creation. In a PM perspective, personal, corporate and structured wikis can be implemented to

support collaboration between coworkers. Majchrzak et al. (2006) conducted a survey with 168 corporate wiki users. They found three main types of benefits from corporate wikis: enhanced reputation, work made easier, and helping the organization to improve its processes. Finally, to choose a wiki platform, a project manager can take into account the wiki's selection and implementation framework proposed by (Grace, 2009). The adoption and usage of this kind of framework in IT projects remains an open question in literature.

2.3.2 Blogs

Weblogs (blogs, henceforward) have become popular because they are easy to manage, create, use and maintain. A blog is a discussion or informational site published on the Web, consisting of entries typically displayed in reverse chronological order. Most blogs are interactive (i.e. open to comments by visitors) and have a set of characteristics that allow them to gain popularity. The technical and behavioral characteristics of project blogs are very lightweight, chronologically sequenced, easily skimmed, with entries easily accessed (Grudin, 2006). Baxter, Connolly and Stansfield (2010), on the basis of Lee, Hwang and Lee (2006), identify five types of blogs: employee blogs, group blogs, executive blogs (e.g. CEO blogs), promotional blogs, and newsletter blogs. Group blogs are mostly used for project-related purposes of both an internal and external nature (Agerdal-Hjermind, 2014).

Regarding the usage of blogs, in a survey of 212 blog participants, Hsu and Lin (2008) found that ease of use and enjoyment, and knowledge sharing (altruism and reputation) were positively related to attitude toward blogging. Blogs can be also used as an information channel or as a communication channel. Westbrook (2012) uses blogs for communication about projects, including assignments for each shift, progress reports on individual projects. This kind of usage also allows project managers to supervise team members remotely (Westbrook, 2012). Reverse blog, which is composed of a set of bloggers rather than a single one, is also useful in the context of a project. It allows coworkers to report on the progress of the project to managers or clients and describes lessons learned. Filev (2008) aims blogs are very simple to share ideas and get feedback through comments.

2.3.3 Microblogging

Microblogging “allow[s] users to exchange small elements of content such as short sentences, individual images, or video links” (Kaplan & Haenlein, 2010). It is a broadcast

medium in the form of blogging that allows users to write brief text updates (usually less than 200 characters) and publish them, either to be viewed by anyone or by a restricted group that can be chosen by the user. Notable active microblogging services are Twitter (twitter.com), Identi.ca, Tout (www.tout.com), Yammer (www.yammer.com) and Communote (www.communote.com).

The simplicity of posting and the ability to do so frequently seem to be what attracts most people to the concept. The characteristics that also make the use of microblogs successful are a) the creation of ambient awareness; b) a unique form of push-push-pull communication; and c) the ability to serve as a platform for virtual exhibitionism and voyeurism (Kaplan & Haenlein, 2010). Creation of ambient awareness refers to the fact that, in combination, different tweets sent out over time can paint a very accurate picture of a person's activities. This feature allows project managers to follow the progress of a team as well as the individual members. Push-push-pull communication refers to the features of one author's tweets being automatically pushed onto the Twitter main page of all followers. If the reader of the message considers the news interesting, he can re-tweeting it to his followers. Once the message has been pushed again, it can motivate users to explore additional information on the subject from other sources (Chaves & Veronese, 2014). This feature facilitates the increase of knowledge among the members of a project.

Beyond these features of microblogging, it is important to consider its affordances, i.e. "action potentials", for PM. Microblogging allows users to share links to webpages, sources of information, or other microblog postings, in a variety of formats. This fosters the easy sharing of knowledge by team members using the microblog. In addition, considering the extensive use of mobile phones, information in photo or video formats tends to increase significantly.

2.3.4 Web-based Office

Web-based office includes a set of tools to manage documents such as videos, create and manage business sites, chat communication or email features, and manage work groups, tasks, activities, including email notifications and calendar management (Rodríguez, Ebert & Vizcaino, 2010). This platform allows collaborative editing, that is a relevant feature in the context of a project (Gloria & Chaves, 2014).

Office 2.0 Web-based office productivity applications, such as Google's Docs and Spreadsheet, are taking shape and gaining popularity (Huang & Behara, 2007). Google Docs is a free-web word processor that allows people to share documents and collaborate online. The

members of a group can have access to the all documents from any computer or a mobile phone that has an Internet connection. All the documents are saved by default in the Google servers without needing to store it in your local hard drive. The documents are automatically saved to prevent the loss of data.

Files can be created, modified, and stored online, eliminating the need for keeping a local copy of programs and documents (Huang & Behara, 2007). Office 2.0 applications allow users to share or even publish their work. This provides a suitable platform for team projects. To collaborate on the financial analysis of an IT project, for instance, a group of staff can work on a common online document, which tracks changes and can sometimes accommodate communicating comments among group members. Many of these Office 2.0 applications are free, and users can control the level of access (Huang & Behara, 2007).

2.3.5 Other Web 2.0 technologies

Rich Site Summary (RSS) is a set of web feed formats used to publish frequently updated works such as wiki and blog entries, audio and video in a standardized format. Using this technology, project members can be automatically notified of updates in a wiki or a blog been used in a project, eliminating the need of periodic visits to search for updates in these sites. The RSS pattern emerged in early 1999 by the team at Netscape, which "put down" the project some time later because they the application was considered not feasible. A smaller company, UserLand, decided to continue the RSS to apply it in their blogging tools. For this, the developers decided to simplify the code and when this task was completed, the RSS 0.91 was released.

A social bookmarking service is a centralized online service, which enables users to add, annotate, edit, and share bookmarks of web documents (e.g. diggo.com) (Noll & Meinel, 2007). In the context of PM, the use of a platform of bookmarking among project members can be useful to capture and share information. There are many blogs and specialized forums that contain a set of problems and solution for a specific problem. In the context of PM, once a project member finds an useful information in a forum or blog, he can bookmark the web site or page and share it with co-workers. Moreover, the search process is facilitated by the use of tags. For instance, a solution to solve a problem performance of software is bookmarked with the tag “performance”, which can help further searches about this topic.

Since social networks (e.g. Facebook), VoIP (Voice over Internet Protocol - e.g. Skype) are most popular web 2.0 technologies, I will not describe them.

2.4 USE OF SOCIAL MEDIA IN PM

The PM landscape is currently updating, opening new competitive advantages for companies (Filev, 2008). According to this author, while some companies are struggling with the pains of traditional PM tools and email, others are becoming more efficient and innovative by leveraging the benefits of the innovative technologies. Those who have already adopted the new tools feel they are indispensable for the business success (Filev, 2008). Despite of this, most of the studies found in the literature so far report the adoption of a single social media tool or several individual, separate tools (Popescu, 2014).

The literature review considers 35 papers, which resulted in 40 contributions. Appendix A present the detail of findings classified by type of social media and type of contribution (T - Theoretical or P - Practical). Although social media include a wide list of tools, the results of the literature review showed that the use of social media in PM was focused mainly on wikis, blogs and microblogging. Figure 5 shows the summary of literature review in terms of purpose of use and type of social media in PM reported by authors.

Purpose of Use	Social Media			Authors
	Wiki	Blog	Microblogging	
Control of Scope	x			Chaves, Tessi, Winter and Damasceno (2015)
Definition of tasks	x			Chaves, Tessi, Winter and Damasceno (2015)
Storage documents	x			Chaves, Tessi, Winter and Damasceno (2015)
Follow-up activities	x			Chaves, Tessi, Winter and Damasceno (2015)
Share knowledge	x	x	x	Grace (2009); Chaves et al., (2015); Westbrook (2012); Cleveland and Ellis (2013); Gloria et al., (2014); Rosa and Chaves (2014); Shang et al., (2011); Chaves and Veronese (2014)
Manage lessons learned	x	x	x	Grace (2009); Veronese (2014); Duffield and Whitty, 2015); Chaves and Pedron (2015); Parker et al., (2007)
Communicate, collaborate and access critical workplace issue	x			Lee and Baby (2013)
Support risk management	x			(Câmara, Chaves, Soares & Tessi, 2015)
Online collaborative projects		x		(Chaves et al., 2015)
Information distribution		x		(Chaves et al., 2015)
Exchange new ideas and brainstorming		x		Gholami and Murugesan (2011)
Interaction between team members		x		Gholami and Murugesan (2011)
Share tasks			x	Riemer and Scifleet (2012)
Share opinion			x	Richter et al., (2013); Riemer and Richter (2010)
Share information			x	Riemer and Richter (2010); Chaves et al., (2015); Richter et al., (2013), Polaschek et al., (2012)
Solve problems			x	Riemer and Richter (2010)

Purpose of Use	Social Media			Authors
	Wiki	Blog	Microblogging	
Socialize			x	Richter et al., (2013)
Coordinate tasks			x	Riemer and Scifleet (2012); Richter et al., (2013); Riemer and Richter (2010)
Make decisions			x	Riemer and Richter (2010)
Capture knowledge instantly			x	(Cleveland & Ellis, 2013)

Figure 5: Summary of purpose of use by author
Source: Author

Social media as a Wiki may be useful in control of the scope, the definition of tasks, storage and documentation of recovery, for collaboration and discussion, and follow-up activities (Chaves, Tessi, Winter & Damasceno, 2015). A Wiki can be also adopted to share knowledge and manager processes through lessons learned (Grace, 2009). Besides the wiki, there are other types of social media such as blog usefull especially in online collaborative projects and they can be used for knowledge sharing, feedback, information distribution, performance reporting, and social dynamics that seek to support PM.

Librarians have been used blogs as tools for collaborative scholarly publication and knowledge management (Westbrook, 2012). Knowledge can be captured instantly through personal notes, reflection, stories and lessons learned using Microblogging (Cleveland & Ellis, 2013). In the same line, social media can support meeting and knowledge sharing in Scrum framework (Glória et al., 2014). Most executives consider essential Web 2.0 technology to the strategy of their organizations. They concluded that Social media could help knowledge management in IT projects nationwide (Rosa & Chaves, 2014).

Shang et al. (2011) illustrated the relationship between Web 2.0 technologies and Knowledge Management. They present a framework that specific how Web 2.0 technologies can support the different elements of their knowledge. The framework contains different Web 2.0 platforms based on which elements of SECI (Socialization, Externalization, Combination and Internalization). In particular, they suggest that the “Aggregator” Web 2.0 service model supports socialization and that “experience-socialization” platforms aid knowledge creation in allowing users to develop their networks.

The use of social media enhances the learning process (Parker et al., 2007). Considering that lessons learned are often informally reported, microblogging has the potential to support this communication between coworkers (Cleveland, 2012). This author proposes evaluating the use of microblogs in the task of recording the lessons learned from the projects. He investigates if microblogging will be accepted and used for capturing lessons learned in PM, to what extent microblogging lessons result in knowledge reuse and how significant the timesaving for

capturing microblogging lessons are when compared to lessons captured via the traditional post-project review method. In additional, the process of management lessons learned could be support through the use of wikis or blogs (Veronese, 2014). In the same vein, Chaves and Pedron (2015) propose the use of Web 2.0 technologies such as wiki, blog, microblogging, web-based office suite, social network and RSS for support lessons learned processes.

Wiki is the most complete tool to deal with LL processes and methods (Chaves, 2013). In this sense, according to the same author, technologies such as blog and RSS can be integrated through a wiki because they come built-in or embedded in the platform. Complementing this issue, Chaves and Veronese (2014) proposed a wiki platform to be used as a centralized repository of lessons learned collected during the entire project life cycle. Furthermore, Duffield and Whitty (2015) suggest the use of wikis to support the dissemination and application of lessons learned from projects.

Social media such a Wiki was proposed in an agile risk-management framework for global IT project settings (Lee & Baby, 2013). The purpose of using a social media in this case is to streamline communication, collaboration among team members, partners and customers in the world and access critical workplace issues. Blogs, Wikis and other second-generation tools stimulate communication and collaboration. Thus, they provide an enormous potential for improving existing PM practices (Filev, 2008). In the same vein, Câmara, Tessi and Soares (2015) propose a framework based on a wiki to support risk management in PM.

A collaborative environment is a common web space for communication, monitoring and controlling the activities of the projects (Franky, 2011) – see Figure 6. In this kind of environment, the participants of a project can be geographically dispersed. A collaborative environment for development of software projects can offer effective alternatives for managing software projects. In case of projects using agile methodologies, it allows help in quality, communication and speed in product delivery to customer (Franky, 2011). According to the same author, collaborative environments for development generally offer three types of facilities:

a) Facilities for communication between developers and customers: to contact and to share in an agile way will raise the speed of global production;

b) Facilities to support the day-to-day management of a project, automating the monitoring of activities to raise the fulfillment and quality of production;

c) Facilities to support the control and projection of a project, through permanent measurement reports about the progress of a project, allowing the manager to correct the overall management.

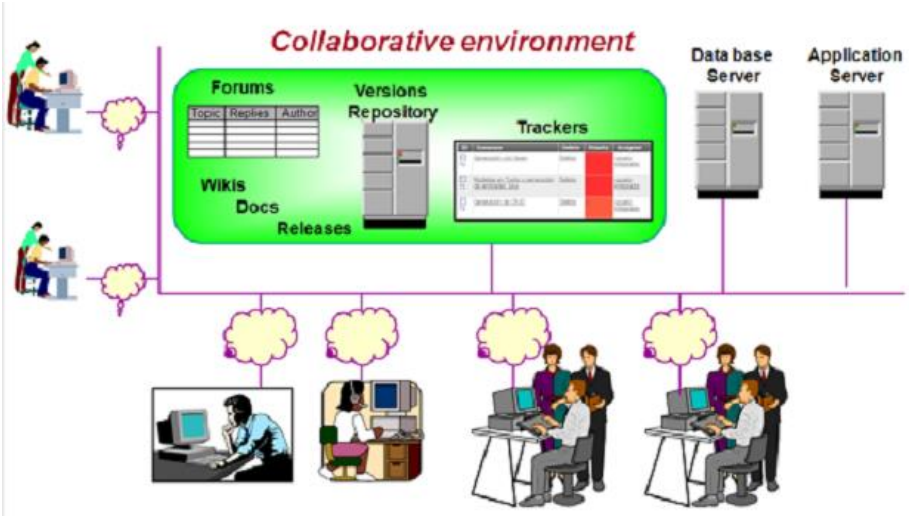

Figure 6: Collaborative environment for development of software projects
Source: Franky (2011, p. 3).

Gholami and Murugesan (2011) present findings on the awareness and level of use of Social media for PM among global teams. They offer recommendations on how the global IT project managers can manage their teams most efficiently and effectively using social media. They also identify which social media tend to have a positive impact on transparency, communication and participation in PM. According to them both wikis and blogs help team members collaborate in a distributed software team (many-to-many collaborative tool). Gholami and Murugesan (2011) conclude that wikis can be used as an information/documentation repository, source of new ideas, workflow management and to monitor the process. Blogs can work to find and exchange new ideas and promote interaction between team members or customer.

Web 2.0 applications have become common in open source and global software projects. They have a valuable means to increase the informal communication exchanged among team members (Lanubile, Ebert, Prikladnicki, & Vizcaíno, 2010). For example, wiki platforms have been used as a practical, economical option for producing and maintaining project documentation by team members (Louridas, 2006). Despite the major engineering tools provide collaboration features, they are implemented exclusively way on different tools so do not permit data integration across the tools (Lanubile et al., 2010).

The use of social media, specially microblogging is been growing by organization (Günther, Krasnova, Riehle, & Schöndienst, 2009). Richter, Richter, Hamann, Riemer, and Vehring (2013) studied the use of the freemium web service Yammer to implement enterprise microblogging in an insurance company. They found that the usage of microblog is

concentrated in four main categories: opinion sharing and discussion, information sharing, problem solving and socializing. Microblogging can be useful to task coordination, time coordination, discussion and clarification, event reporting, input generation, informal communication, information store, and problem solving (Riemer, Altenhofen and Richter, 2011). In additional, Riemer and Richter (2010) found that the usage of the Communote tool was to task coordination, provide update on context and events, share information, solve problems, share opinions and discussion, and make decisions. Finally, microblogging can support coordination of projects, mainly shared tasks and parallel work between people (Riemer & Scifleet, 2012).

An Enterprise 2.0 project is defined as a process intended to achieve the target outcomes with the help of Web 2.0 concepts and technologies such as wikis for project documentation, blogs for top-down communication, tagging and rating of enterprise documents, or enterprise social networking within and across organizations. These concepts and technologies need to be integrated via a single interface to reach their full potential (Auinger, Nedbal & Hochmeier, 2013).

Depending on the purpose of use, each technology has a particular contribution to the sharing of information. However, to achieve its potential they must be integrated using a single interface (Polaschek, Zeppelzauer, Kryvinska, & Strauss, 2012). According to these authors, the best interface for doing this is the wiki. They considered wiki is ease of deployment and has ability to spread virally so it can transform the way enterprise employees access the data in your existing systems and collaborate on intranets and file servers, knowledge bases, content and PM. The collaborative platform done with a wiki interface can serve as an integration platform for applications and secure data access (Polaschek et al., 2012).

The use of social media can be useful in many organization. A successful wiki usage is reported in McAfee and Sjoman (2006). Dresdner Kleinwort Wasserstein, the investment banking division of Dresdner Bamk AG, gained a 75% reduction in e-mail traffic. In addition, they also slashed meeting time in half and found that a user contributes once in every ten visits. Standing and Kiniti (2011) stress the use of wikis for innovation.

Mansour, Askenäs and Ghazawneh (2013) present an empirical analysis of the role of wiki affordances in organizing practices. The technology affordance is defined as “the mutuality of actor intentions and technology capabilities that provide the potential for a particular action” (Faraj & Azad, 2012). First, they suggested eight affordances: visibility, editability, persistence, association, commenting, accessibility, viewability and validation. Then, they identified four properties of these affordances including multiplicity,

referential, situatedness, and communal. These properties represent the main contribution of their paper in that they extend the notion of affordance by theorizing new concepts that describe relational dynamics, situated and contextual conditions, and social factors involved in enacting, perceiving, and exploiting affordances.

The challenges of implementing blogs within organizations can be overcome through properly training to staff informing their organizational benefits (Baxter et al., 2010). On the other hand, Levit (2011) not studied Social media used in PM systematically, but he found some relatively consistent practices of PM 2.0 projects that can influence in the use of Social media for manager agile projects.

An Enterprise 2.0 project achieves the outcomes with the use of social media and technologies as to keep project documentation, communication, rating documents and networking within and across organization (Auinger, Nedbal & Hochmeier, 2013). Projects that are undertaken through global outsourcing can provide great opportunities for competitive advantage. However, it increases risk for managing projects especially in terms of time, resources, scope, and quality (Raisinghani, Arora, Baylor, & Brown-Philips, 2010). Project managers can use web-based social media for virtual PM to work, share and measure performance in the virtual environment (Raisinghani et al., 2010). This allows the project manager to provide an environment that allows team members to work together while simultaneously he lays out tasks, assigns resources, tracks performance, controls, coordinates and work towards the desired result (Raisinghani et al., 2010).

Grudin and Poole (2010) describe the following aspects to be considered in the implementation of social media: a) aligning the expectations of managers and employees; b) organization of content and flexibility to changes of this content over the long term; and c) implement a corporative culture.

In sum, little information is available about the success of the usage of wikis in PM, in terms of user satisfaction, impact on the job and impact on the organization (Arazy, Gellatly, Jang, & Patterson, 2009). Related works on enterprise wikis are still at a rather experimental level (Arazy et al., 2009). To date, the same is true for wiki appropriation and usage in PM, where very little has yet been reported (Stocker, Richter, Hoefler, & Tochtermann, 2012).

3 RESEARCH DESIGN

Figure 7 shows the methodological choices and the main sources considered in this research. Constructivist ontology represents a process that allows meaning to emerge (Patton, 2015). The choice of this ontology was because the framework presented in this dissertation emerged from the practical experiences of PM specialists through interviews and focus groups. This framework presents options for integrated use of social media in PM, solving a practical problem, thus also has a prescriptive characteristic. Prescriptive analysis involves showing the results of data analysis and making a recommendation (Patton, 2015).

Item		Value	Sources
Philosophy of Research	Ontology	Constructivism	(Patton, 2015)
	Epistemology	Social Constructionism and Hermeneutic	(Boell & Cecez-Kecmanovic, 2014)
Research Methodology		Grounded Theory Methodology (GTM) - Constructing School	(Charmaz, 2006)
Methodological Approaches		Exploratory (GTM) Prescriptive (Framework) Inductive (GTM) Intensive (Focus Group) Extensive (Literature Review)	(Patton, 2015) (Charmaz, 2006)
Research Nature		Qualitative	(Patton, 2015)
Data Collection Techniques		Literature Review based on hermeneutics, Active Interview Exploratory Focus Group Confirmatory Focus Group	(Boell & Cecez-Kecmanovic, 2014) (Frankland, Robson, Thomas & Bloor, 2001)
Data Analysis		Based on GTM concepts	(Charmaz, 2006)

Figure 7: Method aspects
Source: Author

A literature review based on hermeneutics is a methodological approach for studying literature reviews as interpretive processes in which a reader expending and deepening understanding of a relevant body of literature (Boell and Cecez-Kecmanovic, 2014). I chose this approach because it permits perform iterations during the process of papers analysis.

Grounded Theory Method (GTM) is preferred in complex organizational situations where prior theories are absent or inadequate (Orlikowski, 1993), which is the case in the integration of social media to support PM. Although GTM is neutral epistemologically (Urquhart and Fernández, 2013), the inductive, contextual and procedural characteristics fit

with an interpretive orientation (Orlikowski, 1993). In the interpretative stance, prescriptive research materializes in a research process with experts exchanging their experience and finally agreeing on the problem solution (Ahlemann, El Arbi, Kaiser, and Heck, 2013).

In consonance with the pragmatic stance, I adopt the Charmaz approach (Charmaz, 2006) as research methodology, which argues for starting the fieldwork prior to the literature review. Since this study is mainly exploratory, I kept the interviews questions open to elicit rich responses (Charmaz, 2006) and I modified the interview protocol as needed after each step of data collection and analysis.

In order to illustrate the methodological choices of this study, the Figure 8 represents the construct of this research adapted by Mazzon (1981). According to this author, this type of representation provides a systematic approach through a matrix representation that connects the main methodological aspects of research, such as objectives, methodological approach, research instruments, and data analysis techniques. The first round of data collection included active interviews, an exploratory focus group, and literature review based on hermeneutic approach. Next, I analyzed the data using GTM concepts. Data collection and analysis took place in alternating sequences over a period of four months until categories of social media reaching saturation. Iterative cycles of induction and deduction involved constant comparison of previous results and new findings to guide further data collection (Corbin and Strauss, 2014). I further develop a Prescriptive Framework for guiding the integrated use of social media in PM. A confirmatory focus group was held to validate the framework.

	Objectives of the research	Methodological approach	Research instruments	Collect / Data analysis techniques
1st cycle	Identify the potential uses of social media in PM	Exploratory	Literature review (Terms: "Web 2.0", "Collaborative tools" and "IT project management" Active interviews (7) Exploratory focus group	Hermeneutic approach GTM (coding and categorizing)
	Identify how the social media can be integrated to support PM	Exploratory	Literature review Active interviews (7) Exploratory focus group	Hermeneutic approach GTM (coding and categorizing)
	Develop a **preliminary** framework for guiding the	Prescriptive	-	GTM (building theory)

	Objectives of the research	Methodological approach	Research instruments	Collect / Data analysis techniques
	integrated use of social media to support PM			
2nd cycle	Identify the potential uses of social media in PM	Exploratory	Literature review (Terms: "Social media", and "projects" Active interviews (11)	Hermeneutic approach GTM (coding and categorizing)
	Develop a framework for guiding the integrated use of social media to support PM	Prescriptive	-	GTM (building theory)
	Validation of the framework for guiding the integrated use of social media to support PM	Exploratory	Confirmatory focus group	-

Figure 8: Construct of the research adapted by Mazzon (1981)
Source: Author

Figure 9 shows the research design based on Grounded Theory.

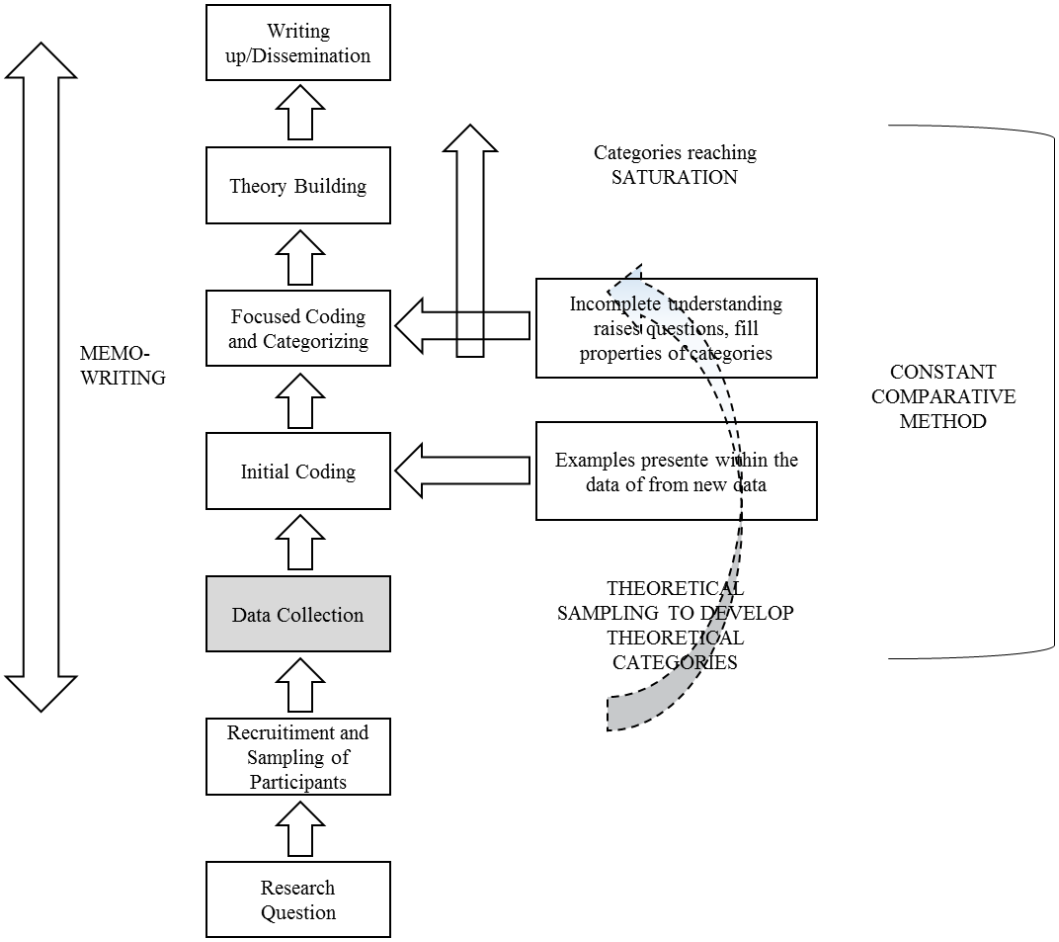

Figure 9: A visual representation of a Grounded Theory.
Source: Charmaz (2006), p. 18

Figure 10 complement the step of data collection in the two cycles. I carried out the fieldwork over four months in the first cycle. Data collection and analysis took place in alternating sequences. This is an iterative cycle of induction and deduction, consisting of collection of data and constant comparison between results and new findings to guide further data collections (Corbin & Strauss, 2014). In the second cycle, I performed new interviews and a focus group confirmatory to validate the framework.

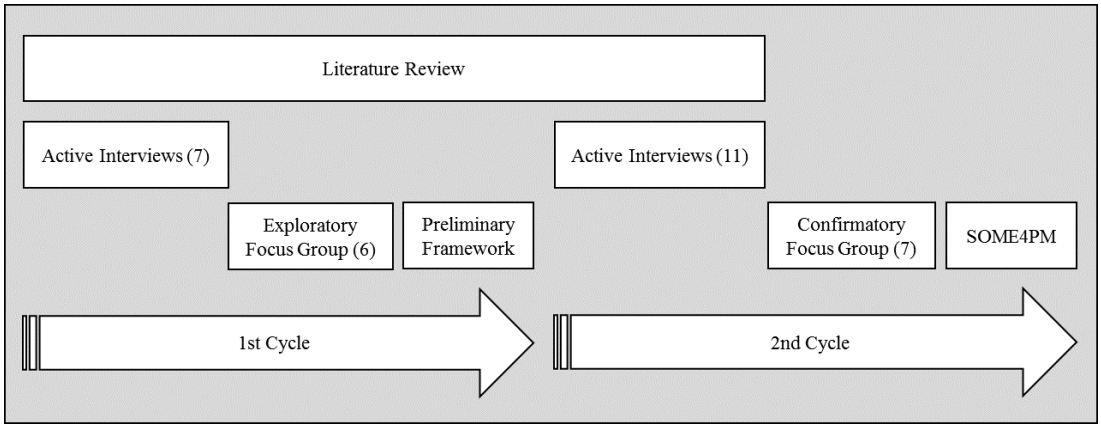

Figure 10: Data collection details.
Source: Author

3.1 DATA COLLECTION TECHNIQUES

I collected the data through hermeneutic literature review, active interviews, an exploratory focus group and a confirmatory focus group, following the process of GTM. GTM requires simultaneous cycles of data collection and analysis.

3.1.1 Hermeneutic literature review

Literature review is a methodological approach aimed at better understanding of a knowledge domain for a specific problem of research (Rowe, 2014). Literature reviews are fundamentally an intellectual pursuit, an understanding process that involves reading, critical engagement, argument development, and writing (Boell and Cecez-Kecmanovic, 2014). Given that interpretation and understanding are central concern of this study, I adopted a hermeneutic approach for reviewing the academic literature on the use of social media in IT PM. The hermeneutic framework is based on two major hermeneutic circles (Figure 1): the search and acquisition circle and the wider analysis and interpretation circle that are mutually intertwined (Boell and Cecez-Kecmanovic, 2014).

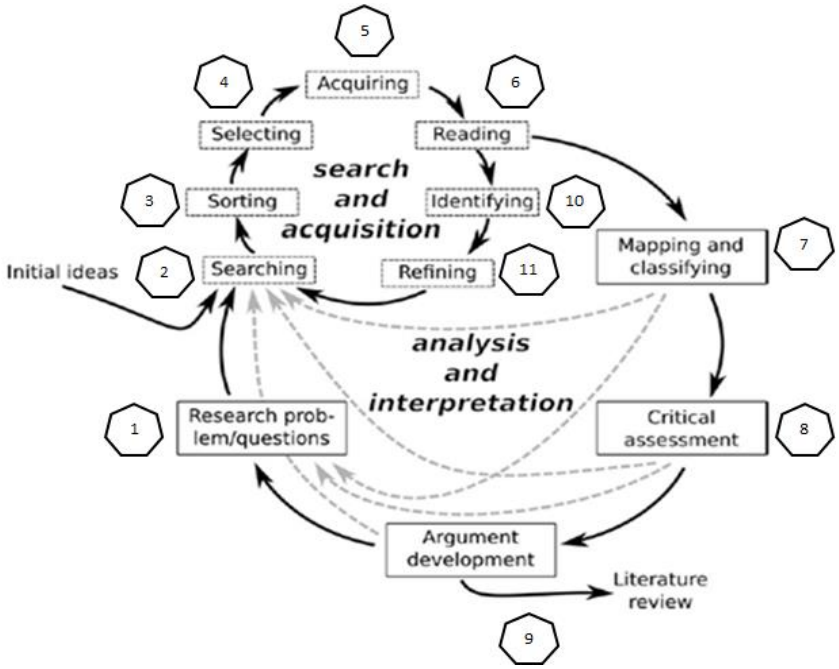

Figure 11: A Hermeneutic Framework
Source: Boell and Cecez-Kecmanovic (2014), p. 9.

The literature review required three iterations through the hermeneutic circles. The first iteration consisted of search by term "Web 2.0". Analysis of research papers identified during the first iteration suggested additional keywords: "collaborative tools" and "social media". Subsequently, these words were used for the next iteration of hermeneutic circles. The third iteration, involving papers referenced in the publications from the first and second iterations, was undertaken to complement the analysis.

Only publications from academic journals and social science conferences have been retained for further analysis. Books and book chapters, papers from disciplines that are not social science (i.e. education, health management), and duplicated references were discarded. Figure 12 lists the steps carried out in all iterations of the hermeneutic circle and describes how the research question emerged as the result of an initial engagement with the literature.

Iteration	Id Circle	Step	Activity
Iteration 1	A&I	1.Research problem/questions	Initial research question: How can the integrated use of **Web 2.0 tools** support PM?
	S&A	2. Search	First round of search using Google Scholar. Search terms: "Web 2.0" and "IT Project Management" Time period: between 2005 and 2015 239 publications found

Iteration	Id Circle	Step	Activity
	S&A	3. Sorting	Classifying publications by type, journal, number of citations, and publication date
	S&A	4. Selecting	Analyzing abstracts and keywords of all publications and narrowing the list down to 8 publications
	S&A	5. Acquiring	Acquiring full texts of selected publications
	S&A	6. Reading	Reading and annotating the acquired publications.
	A&I	7. Mapping and classifying	In depth analysis of the publications in order to identify and classify the concepts, types of contribution (theoretical or practical) and the discussed purpose of the use of collaborative tools.
	A&I	8. Critical assessment	Mapping the core ideas of analyzed papers to identify the gap in the existing literature
	A&I	9. Argument development	After analyzing papers identified in the first iteration, it was noticed that the term “Collaborative tools” is used interchangeably with the term "Web 2.0 tools". It was decided to perform a further iteration using the term "collaborative tools".
Iteration 2	A&I	1.Research problem/questions	Redefining the research question: How can the integrated use of **collaborative tools** support PM?
	S&A	2. Search	First round of search using Google Scholar. Search terms: “Collaborative tools” and “IT Project Management” Time period: between 2005 and 2015 70 publications found
	S&A	3. Sorting	Classifying publications by type, journal, number of citations, and publication date
	S&A	4. Selecting	Analyzing abstracts and keywords of all publications and narrowing the list down to 5 publications
	S&A	5. Acquiring	Acquiring full texts of selected publications
	S&A	6. Reading	The papers acquired were read and annotated by the research team.
	A&I	7. Mapping and classifying	In depth analysis of the publications in order to identify and classify the concepts, types of contribution (theoretical or practical) and the discussed purpose of the use of collaborative tools.
	A&I	8. Critical assessment	Mapping the core ideas of analyzed papers to identify the gap in the existing literature
	A&I	9. Argument development	It was decided to perform a further iteration with "snowball" sampling method, and analyze publications referenced by those publications found in the first and second iterations.

Iteration	Id Circle	Step	Activity
Iteration 3	A&I	1.Research problem/questions	Redefining the research question: How can the integrated use of **social media** support PM?
	S&A	2. Search	Analyzing bibliographies of papers found during first two iterations. Criteria for selection: papers addressing the use of social media in organization environment 22 publications found
	S&A	3. Sorting	Classifying publications by type, journal, number of citations, and publication date
	S&A	4. Selecting	Analyzing abstracts and keywords of all publications and narrowing the list down to 22 publications
	S&A	5. Acquiring	Acquiring full texts of selected publications
	S&A	6. Reading	Reading and annotating the acquired publications.
	A&I	7. Mapping and classifying	In depth analysis of the publications in order to identify and classify the concepts, types of contribution (theoretical or practical) and the discussed purpose of the use of collaborative tools.
	A&I	8. Critical assessment	Mapping the core ideas of analyzed papers to identify the gap in the existing literature
	A&I	9. Argument development	The resulting set of publications was considered sufficient for this study, as the search results with similar terms (such as "social media") have become repetitive.
	S&A	10. Identifying	Based on Reading step, I identified additional papers that also addressed the use of social media in an organizational environment.
	S&A	11. Refining	I used the citation tracking as search strategies to improve the precision of literature review.

Figure 12: Iteration steps conducted in the literature review based on hermeneutics.
Note: A&I stand for Analysis and Interpretation, S&A stands for Search and Acquisition
Source: Author

3.1.2 Active interviews

I chose the semi-structured rather than structured interview format because it offers the flexibility to approach each interviewee differently while covering the same areas of data collection. I follow an interview protocol to provide adequate coverage for the purpose of the research. Questions in the interview protocol were developed prior a detailed literature review. They were developed in the form of a general statement, which were followed by a sequence of sub-questions for further probing. The questions were then piloted with an IT project

manager. The pilot aimed to identify redundancies, help clarify the text, and include or exclude some questions. Adjusted interview protocol was used with practitioners having different roles in the management of projects being interviewed to investigate their point of view about social media in PM. The interviews were recorded to secure an accurate account of the conversations and prevent the loss of data. Every file was numbered and labeled with the name of the interviewee in order to avoid complications and facilitate recovery of information.

I carried out semi-structured, in-depth interviews with open questions to obtain in-depth knowledge of project managers and project members. I developed the questions in the interview protocol prior the literature review, because according Charmaz (2006), acknowledges delaying the literature review allow the researcher to articulate their own ideas. Appendix B presents the interview protocol. I developed major questions in the form of a general statement, which will be then followed by a sequence of sub-questions for further probing. The questions were then piloted with one IT project manager. The piloting aimed at identifying ambiguities, helping to clarify the wording of questions and permitting early detection of necessary additions or omissions. Adjusted interview protocol was used with practitioners having different roles in the management of projects being interviewed to investigate their point of view about social media. Each interview was tape-recorded to secure an accurate account of the conversations and prevent the loss of data. Thereafter, all interviews were transcribed and sent to the interviewees for approval. Every file was numbered and labeled with name of corresponding interviewee to facilitate data recovery.

The interviews were transcribed. In first cycle, I analyzed the data using MAXQDAplus. It is a software for qualitative and mixed methods analysis that includes the add-on module MAXDictio, which allows the researchers to do dictionary-based quantitative content analysis. The aim was used to develop a more in-depth and qualitative analysis of the interviews. MAXQDAplus helped me to find the frequency of codes and to write memos. Based on this first step, I used Excel to identify the categories and properties of categories. This analysis was carried out using a coding schema derived from GTM. Findings of the study were compared with the existing literature.

The number of interviews in qualitative research depends on the purpose of the work. The saturation of categories and emerging concepts is a consistent indicator to the practice of grounded theory to define the number of interviews (Charmaz, 2006). According to the same author, grounded theorists consider that twelve interviews is sufficient for most researchers when they aim to discern themes concerning common views and experiences among relatively homogeneous people, but may not command respect. The interview sample included eighteen

participants, seven in the first cycle and eleven in the second cycle; the most of them are project managers, representing a wide variety of expertise, which is in line with the Creswell (2012)'s recommendation. These interviewees generated more than seven hours of transcribed data. Table 1 presents the interviewees´ profile.

Table 1: Interviewees profile

Cycle	ID	Role	Age	Years as GP	Company activity	Number of Employees	Interviewer time
1	I1	Project Manager	41	17	IT	9	0:12:03
1	I2	Professor/IT Consulting	58	15	IT	>5.000	0:21:55
1	I3	Services Management	52	17	IT (*)	>10.000	0:26:52
1	I4	Project Manager	51	25	Finance	>100.000	0:25:34
1	I5	Project Manager	36	6	IT	1.000	0:25:41
1	I6	Project Manager	41	8	Finance	90.000 - 100.000	0:18:52
1	I7	Project Manager	55	15	Telecom (*)	300	0:22:12
2	I8	Project Manager	33	10	Insurance	>6.000	0:17:50
2	I9	Project Manager	39	10	PM Consulting	10>	0:25:13
2	I10	Project Manager	37	5	Private Finance	230	0:30:19
2	I11	Project Manager	44	6,5	Insurance (*)	>4.000	0:25:38
2	I12	PMO Manager	36	15	IT (*)	>20.000	0:34:07
2	I13	PMO Manager	32	9	IT (*)	>20.000	0:37:02
2	I14	Project Manager (Delivery)	44	26	IT (*)	>20.000	0:15:35
2	I15	PMO Manager	40	23	IT (*)	>20.000	0:22:47
2	I16	PMO Manager	40	14	IT (*)	>20.000	0:15:42
2	I17	Software Engineer	38	4	IT	>9.000	0:38:45
2	I18	PMO Manager	41	5	IT (*)	15.000 - 18.000	0:19:04
						Total	**7:15:11**

Source: Author
(*) Multinational organization

3.1.3 Exploratory Focus Group (EFG)

Focus group can provide more than generating information about collective opinions about product or even its packaging, as they react to facts and policies (Frankland, Robson, Thomas & Bloor, 2001). In terms of this research, EFG was used to close the literature review gaps and to provide some practical insights and in-depth understanding of the use of social media in organization. The participants are selected for convenience and the success of the group depends in part on the relationship and dynamics among the individuals in the group,

since the researcher should consider these profiles when composing and performing a success group. On the other hand, the diversity of the group promotes greater depth achieved by the group (Frankland, Robson, Thomas & Bloor, 2001).

Appendix D presents the EFG protocol. The focus group meeting, performed in the first cycle, lasted 1 hour and 13 min. Since Smithson, Bloor, Franklin, Thomas & Robson (2001) suggest a focus group with six to eight participants, I recruited six experts project managers who use social media in professional environment to be part of the meeting. As the success of a focus group session depends a lot on the dynamics between the group members, the participants had different professional backgrounds, so they could contribute with different perspectives and enrich the quality of the discussions. The moderator must motivate all participants to share their opinions constructively, as recommended by Smithson et al. (2001). The group was composed by project managers from different areas, as telecommunications, technology information, infrastructure, insurance and public sector. Their ages ranged from 32 years to 52 years. Years of experience as a professional project manager ranged from 8 to 15 years. All of them signed in the consent form for focus group participation (Appendix C). The participants received A3 blank worksheets for taking notes during the session. Table 2 shows participants' profile.

Table 2: Exploratory focus group participants' profile

ID	Role	Age	Years as GP	Company Activity	Number of Employee	EFG Time
EFG1	Project Manager	52	15	IT Infrastructure	>10000	1:56:16
EFG2	Project Manager	42	11	IT	230	
EFG3	Project Manager	40	10	Telecom	>33.000	
EFG4	Project Manager	32	10	Petrochemical	>5000	
EFG5	Project Manager	37	8	Hardware PC	>20000	
EFG6	Project Manager	46	10	Health	22	

Source: Author

The participants of EFG discussed questions related to the drivers and barriers of social media use in PM. Subsequently the discussion was re-focused on strengths and weaknesses of the social media use in PM. Next, the participants reflected on the use of social media in their projects and possible ways for the tools integration. A conceptual framework for social media use in PM was generated after the last meeting of the EFG, based on the group members' contributions.

3.1.4 Confirmatory Focus Group (CFG)

The participants of the CFG were encouraged to validate the framework for integrated use of social media in PM. First, four categories of social media were identified and unanimously validated: communication, control, dissemination and repository. The moderator presented a set of tools for each category mentioned during the interviews. Along the session, the focus group participants suggested to include other tools and expanded the scope of use of some tools. Second, based on the literature findings, the participants were asked about their applicability in PM. Participants suggested tools that should be included in the framework, and commented on the tools that they did not recommend. Finally, the moderator presented the framework validated by all, with the inclusion of the considerations provided during the session.

I adopted the same procedure in both focus groups. Appendix D presents the EFG protocol. The audio of focus groups was recorded with the permission of the participants, transcribed and then checked for accuracy. The CFG lasted 1 hour and 13 min. All of them signed in the consent form for focus group participation (Appendix C). Table 3 presents the confirmatory focus group participants profile.

Table 3: Confirmatory focus group participants' profile

ID	Role	Age	Years as GP	Company Activity	Number of Employee	CFG Time
CFG1	Project Manager	30	6	Telecom	>33.000	1:13:00
CFG2	Project Manager	53	10	Insurance	>5.000	
CFG3	Project Manager	27	4	Telecom	+- 129.000	
CFG4	Project Manager	37	12	Insurance	+- 14.000	
CFG5	Project Manager	53	2	Industry	+-50	
CFG6	Project Manager	42	4	Security	+- 100.000	
CFG7	Project Manager	41	10	Security	+- 100.000	

Source: Author

3.2 DATA ANALYSIS PROCEDURE

Glaser and Strauss developed the GTM in 1967 as a reaction against the extreme positivism that had permeated most social research (Suddaby, 2006). Data analysis used GTM to open-code, conceptualize, categorize by constant comparison and memoing (Glaser & Strauss, 1967). This method was selected because the research involves the creation of a framework that is aligned with the nature of GTM.

Grounded Theory is a complete methodology that consists of five steps for data analysis:

- Open coding of the data for conceptual understanding;
- Constant comparison of codes, concepts and categories as they emerge from the data;
- Memoing for clarity of thought;
- Discovery of the core category which becomes the focus for selective coding;
- Theoretical coding that investigates the links between categories.

Table 4 lists in chronological order the works considered seminal grounded theory texts because they are characterized by their originality of thought and subsequent influence (Birks & Mills, 2011).

Table 4: Seminal Grounded Theory texts

Year	Author	Title
1967	(Glaser and Strauss 1967)	The discovery of grounded theory
1978	(Glaser 1978)	Theoretical sensitivity
1987	(Strauss 1987)	Qualitative analysis for social scientists
1990	(Strauss and Corbin 1990)	Basics of qualitative research: Grounded theory procedures and techniques
1992	(Glaser 1992)	Basics of grounded theory analysis
1994	(Strauss and Corbin 1994)	'Grounded theory methodology: An overview' in Handbook of qualitative research
1995	(Charmaz 1995)	'Grounded theory' in Rethinking methods in psychology
1998	(Strauss and Corbin 1998)	Basics of qualitative research: Grounded theory procedures and techniques (2nd Edition)
2000	(Charmaz 2000)	'Grounded theory: Objectivist and constructivist methods' in Handbook of qualitative research (2nd Edition)
2005	(Clarke 2005)	Situational analysis: Grounded theory after the postmodern turn
2006	(Charmaz 2006)	Constructing grounded theory: A practical guide through qualitative analysis

Source: Birks and Mills (2011)

Based on the evolution of GT, it is possible to identify three different lineages of the method. Figure 13 shows the lineages.

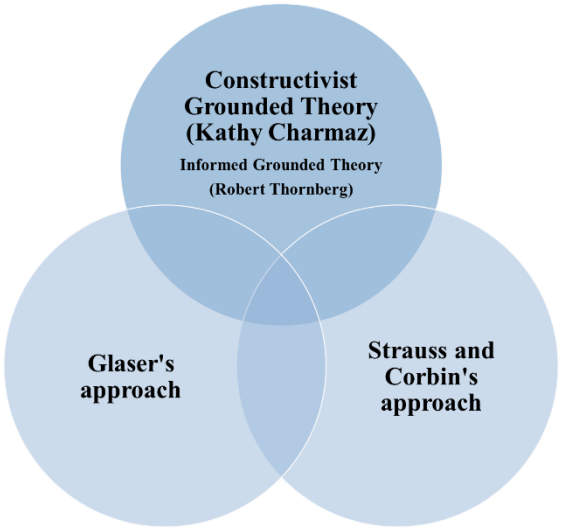

Figure 13: Grounded Theory lineages
Source: Author

Figure 14 shows the mains aspects of each approach. In this research, I will use Charmaz (2006) approach. This approach leads a research practice where data sampling, data analysis and theory development are not seen as distinct and disjunct, but as different steps to be repeated until one can describe and explain the phenomenon that is to be researched. This stopping point is reached when new data does not change the emerging theory anymore. A later version of GT called constructivist GT, assumes that neither data nor theories are discovered, but are constructed by the researcher as a result of their interactions in the fieldwork and its participants (Charmaz, 2006). This same author treats the delaying of the literature review as an opportunity to researchers articulate their own ideas.

Classsic GT (Glaser - 1978)	Straussian (1987)	Constructivist GT (Charmaz - 2006)
A pre-study literature review in the substantive area and closely related areas should be avoided	An early review of the literature is advocated, but there is no need to review all of the literature in the field	Acknowledges delaying the literature review to allow the researcher to articulate their ideas. However, tends to focus on the expectation of a literature review in the research process
Extant literature is incorporated through comparative analysis when the core category emerges and the theory is well developed	Engaging with the literature is on-going and can be used as a secondary source of data or for comparisons with the data	Extant literature can help the researcher clarify ideas and make comparisons. Sensitizing concepts can be used as points of departure
Extant literature in the early stages can introduce preconception and detracts the researcher's attention from what is actually going on in the data	Extant literature can hinder creativity if it stands between the researcher and the data	Extant literature should be used without letting it stifle creativity or strangle the theory
If a literature review is done, then it should be incorporated into the analysis as data	The literature can direct theoretical sampling, help with concept	The literature helps to demonstrate grasp of relevant works, identify significant findings and

Classsic GT (Glaser - 1978)	Straussian (1987)	Constructivist GT (Charmaz - 2006)
	development and defining properties and dimensions	connections between the research and earlier studies
Engaging with the literature in the substantive area erodes the researcher's theoretical sensitivity, however the researcher should be continuously reading in other substantive areas to enhance their theoretical sensitivity	Engaging and being familiar with the literature can help improve theoretical sensitivity, and help formulate research questions	

Figure 14: The role of literature on GT: Comparison among the 3 GT approaches
Source: Yarwood-Ross and Jack (2015), p. 20

Processes of grounded theory are grounded on the ability to gather and analyze data. The results of which lead to the generation a theory. The theory evolves through the research process and this is a continuous interplay between analysis and data collection (Glaser & Strauss, 1967). Using the methods of GT is possible to model and remodel the data collection, adding "new pieces to the puzzle," which can occur even later in the data analysis phase. The flexibility allows adjustment of qualitative studies in the course of collection; there may be changes in the interview protocol or any other routine to get data (Charmaz, 2006). Charmaz (2006) defines the fundamental elements of GT as:

- Fit - has to do with how closely concepts fit with the incidents they are representing, and this is related to how thorough the constant comparison of incidents to concepts was done;
- Relevance - A relevant study deals with the real concern of participants, evokes "grab" (captures the attention) and is not only of academic interest;
- Workability - The theory works when it explains how the problem is being solved with much variation;
- Modifiability - A modifiable theory can be altered when new relevant data is compared to existing data. A GT is never right or wrong, it just has more or less fit, relevance, workability and modifiability.

The primary coding technique to be used to examine interviews and exploratory focus group is **initial coding**, also known as open coding, which provides a good starting point to identify initial phenomena and produce a list of themes of importance to the interviewee. I assigned codes to participants' words and statements to develop concepts, constituting the start of the analytic process. After this, I performed the **focused coding and categorizing**, also known as axial coding and selective coding to relate codes to each other and to group codes into categories. Memo writing is an intermediate stage between data collection and write-up

and involves the detailed capturing of the researcher's thoughts, hunches, interpretations and decision-making throughout the analysis. Memos supported the creation of theory. Finally, theoretical sampling is a strategy designed to sample new data actively in order to develop, refine and elaborate the **theory building** (Charmaz, 2006). The same steps will be executed in the second cycle of this research.

The framework to guide the integrated use of social media to support PM draws on triangulation of data from four sources: literature review, interviews, EFG and CFG. First cycle of data collection led to development of the preliminary framework, which was subsequently refined after the second cycle of data collection. The framework presented during CFG was further updated according to suggestions of the participants.

4 ANALYSIS OF RESULTS

This section presents the results of the data analysis. The results of the literature review about the use of social media in PM were presented in section 2.4 page 31. The analysis of the interviews and exploratory focus groups followed the steps of GTM as presented in Figure 9, page 40. The data collection was divided into two cycles. The first cycle included 7 interviews and an EFG. Based on the first cycle, a preliminary framework was created (Figure 18). The analysis of results in this cycle allowed improving the interview protocol for the second cycle. The second cycle included eleven more interviews and **development of a prescriptive framework for guiding the integrated use of social media to support PM**. Finally, a CFG was used to validate this framework.

The first cycle of data analysis resulted in identifying a preliminary list of codes (**Initial Coding**) and organizing them to establish relationships (**Focused Coding**). These relationships and analysis of the memos allowed grouping the codes into four social media categories that included characteristics and events associated with the use of social media in PM (**Categorizing**). Each of these emergent categories captures two dimensions: one is related to the purpose of using social media and other is related to the type of tools. A preliminary framework emerged during the next stage, **Theory Building**. However, some questions remained open after the identification of the categories and properties, mainly regarding the integration of the tools. This points out the need to conduct a new cycle of interviews to seek a better understanding of the phenomenon. The second cycle of analysis, involving 11 interviews and a CFG, followed the same steps of GTM as the first cycle. The process of **Constant Comparative Method** ended when analysis did not emerge new categories or sub-categories, nor criticize those already identified in the first cycle, reaching theoretical saturation. The analysis presented in following items contains the results of both cycles.

4.1 INITIAL CODING

I identified 254 incidents in the **initial coding** procedures grounded by interviews and EFG. The codes names emerged from the memos registered during the analysis process. For each set of data obtained in each interview, a systematic comparison of the codes was performed according to the GTM **constant comparative method**. Additional codes were identified and

added to the list during the CFG. Figure 15 and 16 show all identified codes, classified by propriety of code and ranked by number of incidents.

Purpose of Use Codes (PU)								
ID Code	**Code**	**N**	**ID Code**	**Code**	**N**	**ID Code**	**Code**	**N**
PU1	Projects and management documentation	31	PU8	Lessons Learned	5	PU15	Indicators	1
PU2	Management tools	23	PU9	Online communication	5	PU16	Interaction between team members / Socialization	1
PU3	Chat communication	12	PU10	Share Knowledge	5	PU17	Make decisions (*)	1
PU4	Project control information	10	PU11	Follow-up activities	4	PU18	Presentations (*)	1
PU5	Remote Meetings	9	PU12	Delivery management	3	PU19	PM processes	1
PU6	Organization information / Standards	8	PU13	Share Information / tasks / opinion	3	PU20	Video Conference	1
PU7	Knowledge base	6	PU14	Tasks management	2	PU21	Workflow	1

Figure 15: Purpose of Use codes (PU).
Note: Codes marked with (*) were included during CFG; N: Number of incidents.

Social Media Codes (SM)								
ID Code	**Code**	**N**	**ID Code**	**Code**	**N**	**ID Code**	**Code**	**N**
SM1	Sharepoint	15	SM11	Dropbox	3	SM21	Office 365	1
SM2	Skype/Lync	15	SM12	Hangout	3	SM22	Outlook (*)	1
SM3	Wiki	13	SM13	Clarity	2	SM23	Pbworks	1
SM4	EPM	12	SM14	Blog	1	SM24	PPM (*)	1
SM5	Google drive	10	SM15	Box	1	SM25	RTC (*)	1
SM6	Whatsapp	10	SM16	Confluence	1	SM26	Smartsheet (*)	1
SM7	Private	8	SM17	Evernote	1	SM27	SVM (*)	1
SM8	Onedrive	5	SM18	Flex	1	SM28	Telegram (*)	1
SM9	Jira	4	SM19	Git Hub	1	SM29	Trello	1
SM10	Redmine	4	SM20	Lotus Notes (*)	1	SM30	Webex	1

Figure 16: Social Media Codes (SM).
Note: Codes marked with (*) were included during CFG; N: Number of incidents.

4.2 FOCUSED CODING AND CATEGORIZING

Focused coding is the second major phase in coding. The codes identified in this phase can repeat initial codes or represent groups of initial codes. In focused coding, codes are used to filter, sort, synthesize and analyze large amounts of data (Charmaz, 2006). This process involves decision on a set of initial codes that make the most analytic sense and categorize the

data incisively and completely. The data of each new interview were analyzed and compared. Thus, the initial codes were refined and the categories were consolidated. This confrontation is one of the foundations of Grounded Theory, which allows the enrichment of the emerging framework in light of new analyzes (Charmaz, 2006). As a result, the focused coding and categorizing procedures resulted in four categories of social media: I) Communication; II) Control; III) Dissemination; and IV) Repository. The categories were further analyzed along two dimensions: propose of use and tool. All the categories and subcategories were validated through CFG. Figure 17 summarizes the findings of this stage. Colum Category contains the four categories. Colum Subcategory (Property) contains codes related to propose of use and codes related to corresponding social media.

	Subcategory (Property)																														
Category	Code (Propose of use)	Code (Social Media)																													
		Blog	Box	Clarity (CA)	Confluence	Dropbox	EPM (Microsoft)	Evernote	Flex	Git hub	Google drive	Hangout	Jira	Lotus Notes	Office 365	Onedrive	Outlook	Pbworks	PPM (HP)	Private	Redmine	RTC	Sharepoint	Skype / Lync	Smartsheet	SVM	Telegram	Trello	Webex	Whatsapp	Wiki
Communication	Chat communication								x					x													x			x	
	Interaction between team members / Socialization	x										x												x			x		x	x	
	Make decisions											x					x							x			x		x	x	
	Online communication													x			x							x			x			x	
	Presentations													x										x					x		
	Remote Meetings													x										x					x		
	Share Information / tasks / opinion											x					x	x						x			x		x	x	x
	Video Conference													x										x					x		
Control	Delivery management																				x										
	Follow-up activities			x								x						x						x						x	x
	Indicators						x												x												
	Project control information						x						x						x				x		x			x			
	Tasks management						x												x									x			
Dissemination	Lessons Learned	x						x				x	x				x						x	x			x			x	x
	Organization information / Standards																														x
	Project management processes												x							x											x
	Share Knowledge	x				x		x					x										x							x	x
	Workflow				x								x																		
Repository	Knowledge base		x			x	x				x					x				x			x			x					x
	Projects and management documentation		x	x		x	x				x					x				x			x			x					x

Figure 17: Categories, Subcategories and Codes
Source: Author

4.2.1 Communication

Communication is one of the key determinants of project success (Doloi, 2009). With the advancement of technology, it is increasingly common for organizations to work with virtual teams or home office. In this sense, the use of social media that allows online communication becomes necessary. This category can be compared to the Interpersonal category defined by Safko (2010). “Tools in this category facilitate people-to-people communication and collaboration” (Safko, 2010, p. 32).

Respondents use different kinds of social media to conduct communication between team members and sharing information:

“We use Flex and Google Hangouts for chat …” (I10).

“Pbworks is also a collaborative environment, … you can save a project there, …” (I2).

"In the same tool (Wiki), there is an area where people can post ideas and suggestions for improvement ..." (I4).

"Currently, we have a tool that was developed by the company ... This tool works like a wiki, and contains information about PM, processes, so others can use and get information" (I6).

"We use two tools, which are Link and Webex that allows us to make online meetings, video conferences, meetings through video, sharing text, documents and everything" (EFG4).

In addition, many of participants reported conducting videoconferences and presentations through social media. The growing use of tools for communication via chat was also noticed.

> *"So, we really have used it a lot for follow up activities... So I think WhatsApp is a good tool that we are using" (I12).*

WhatsApp is a communication tool widely used by interviewees. It is free and allows fast communication via chat independent of the physical location of the team.

"As the team is small, we use either WhatsApp or skype, so we end up sending messages via chat" (I1).

"We use WhatsApp for faster communication" (I8).

"To make fast communication we use WhatsApp, we form groups with people involved in projects and we have a communication sometimes faster than when we call them directly" (I12).

In regard to Skype, although most people do not use this tool as an official way of communication, many of them make important decisions of their projects using Skype, such as requests approvals and resolving bugs and incidents. Many interviewees use Many have used Skypeto conduct business meetings, especially when the team members work as home office regime or in different locations.

"Here we also use Link and Skype for video conferences" (I8).

"As our contact was in a North American company, we used Skype a lot, all the meetings about the implementation of the system or development of some new module for the system was always made via Skype" (EFG 6).

4.2.2 Control

The process of project monitoring and control includes collecting, measuring and disseminating performance information, evaluating measurements and trends to make process improvements (PMI, 2013). It also includes risk management activities to ensure that risk is identified and the risk plans are implemented. Project monitoring should occur during the whole project lifecycle. It involves the issuance of progress reports, generation of indicators and forecasting. Interviewees and focus group participants claim that one of the purposes of using social media would be project control.

Based on these reports, the Control category emerged. For this category, the codes referring to the purpose of use and the codes referring to the tools used for this purpose have been grouped. It has been observed that several tools can contribute in this category. Participants reported that they use EPM, Jira, HP PPM, SharePoint, and Trello to track project information:

"Jira is the most important tool for me because it has visibility features of the tasks. Who is doing what and at what time, how long that task is with that person, …" (I10).

"I would include SharePoint as well. For example, I do all project approval control in Sharepoint. It gives control on the tests, scenarios, who is responsible for a certain phase of the test of that scenario, …" (CFG2).

Redmine was cited as a delivery management tool:

"We use Redmine to manager deliveries" (I17).

Regarding follow-up activities, participants reported using Clarity from CA, Hangout, Pbworks, Skype, Wiki and WhatsApp.

"We have concentrated a lot of information on Clarity ... We have pointed out the current situation of the project" (I11).

"Pbworks is also a collaborative environment, ... you can save a project there, ... then you can open a space that you can grant access to people, you can share files, you can follow-up activities" (I2).

"When you enter the tasks and the dates, the tool creates the schedule" (I10).

"We use a lot of Whatsapp, Skype and Hangout, for follow up activities" (I9).

During CFG, a participant suggested including Smartsheet into project control category:

"Another one being well used in the market called Smartsheet. It works as a reduced EPM, but has all the necessary resources to control agile projects" (CFG4).

In addition, EPM and PPM were cited as tools for generating indicators.

"In EPM we insert all the control and governance part of projects, we have Schedule Performance Index (SPI) indicators, Cost Performance Index (CPI), project forecast based on the professional hours' record, the time they spend analyzing the activities" (I12).

"I use HP from PPM. It provides information for generating indicators, both the board and the PMOs have access to this tool" (CFG1).

Finally, EPM, PPM and Trello were reported as useful for task management.

"Our company uses Microsoft EPM and it has handled very efficiently for PM as we have the visibility of the current project situation. The information you want is centralized and focused on providing an effective reporting" (I12).

"I use Trello a lot here. This tool uses the idea of TO DO, DO and DONE. You can put backlog ..." (I17).

4.2.3 Dissemination

This category included action and web-based applications related to sharing such knowledge as lessons learned process, PM processes, workflow information, standards and organization information in general. Safko (2010) classifies this category as "publish". According to him, this category includes any web-based application that involves employees, customers, or prospects. This broad category includes even tools that facilitate e-mail campaigns, blogs, and wikis. Many of these tools can manage online content.

Many interviewees report the use of social media for managing lessons learned.

"We record lessons learned from each service, it has information about facts, about the interfaces are recorded there (SharePoint) to be divulged, that is, to manage the knowledge base of the team" (I3).

"In the case of projects, we keep lessons learned from delivered projects, we have a community checklist to people pay attention in some points, publish system development tips ..." (I6).

One of the interviewees reported using Wikis as knowledge base.

"... because in Wiki we generated a lot of knowledge throughout the project and this knowledge is reused in future projects" (I9).

Another interviewee commented that he uses wiki to share knowledge.

"We use Wiki to share knowledge and document legacy systems" (I17).

During the CFG, the participants were encouraged to give opinion about which tool could play the integrator role. The participants unanimously proposed Wiki. In regard to publishing organizational information and standards, most of interviewees use Wikis to keep this information.

"Wiki is used for publication of tutorial videos, procedures to use a specific methodology of PM. It has been widely accepted among people who have to use this methodology because people can find videos within the Wiki that can help them to use it" (I4).

"We use Wiki for dissemination, communication, template patterns, this kind of thing, it has information related to process and methodology, we do not use it as a tool for project repository" (I17).

"There is a Wiki, and every new consultant can know what his roles are, what are the artifacts he uses, what are the areas, what are the permissions he needs to have to work" (EFG1).

Other interviewees reported using Jira and blogs:

"Jira allows you to record the tasks that will be done and assign them to the people, the Jira also allows to generate a workflow ..." (I10).

"We have a blog to share knowledge, to disclose news, new things related to technology, process related ..." (I6).

"We have a blog in WordPress where we post articles, post news that happen in operations" (I18).

4.2.4 Repository

Most of interviewees reported using productivity tools such as Dropbox, Google drive or OneDrive, for both personal and professional purposes. These tools can be used as repository of project documents, for storing and sharing information, formal communication and submissions for authorization. I noticed that these kinds of tools are well accepted by users because of the ease of use. Besides these tools, interviewees mentioned such tools as Wiki, Box, Clarity, EPM, SharePoint, SVM as well as proprietary tools.

Wiki is most mentioned within the "Dissemination" category:

"[we use Wiki]… to maintain and publish PM information" (I1).

"Each project has a website, it's a kind of wiki where you put all project information, … other documents to everyone on the project to easily access of information" (I7).

"We use Wikis as the project knowledge base" (I9).

Data storage tools, e.g., Dropbox, Google Drive and OneDrive, are used the most by the interviewees:

"We use Dropbox to share information about projects in small business. This information could be edited by me and by anyone who had access to that sharing" (I3).

"I worked with OneDrive to store the documentation for the area" (I5).

"I use OneDrive for storing project documents" (I14).

"When I start a project, I create a document in Google Docs and present it to the client, hence the client works on the document on his own, and I have access to the current version" (I1).

"All documents, from the initial planning, project specifications, material distribution control, schedule, are stored in Google Drive" (I7).

I observed that large organizations use social media carefully. They tend to be more attentive to the issue of information security, so they opt for formal tools such as SharePoint and EPM.

"Internally we use SharePoint to store project documents and service management documents. These documents are stored to perform the knowledge management and exchange of experience among the collaborators of a project" (I3).

"SharePoint is our repository channel for documentation, disclosure, reporting, monitoring of approval and test scenarios" (I8).

"During PM we use SharePoint, which is used for the team to exchange ideas and learn" (I13).

"EPM has repositories for storing deliverables and contracts" (I12).

"We have a private tool that works as EPM from Microsoft, where we centralize all project documentation" (EFG3).

Other tools were also mentioned as repository of information.

"Atlassian has a product called Confluence that looks like a wiki. We use to do knowledge management, definition of technical manuals, some more technical documentation is kept into Confluence" (I10).

"We use Clarity from CA as a project tool" (I11).

"We use SVM for projects repository" (I17).

"In my case, all the documents are in the Box, they are in the cloud. It is mandatory to use collaborative tools, because currently everyone works thought mobile devices" (EFG5).

4.2.5 Integration

The majority of interviewees does not use social media in an integrated way:

"Today it is independent, we have no integration" (I8).

Most use a single tool or multiple tools separately. This fact coincides with the results found in the literature by Popescu (2014). Although the respondents do not know or do not use integrated social media tools, most of them agreed that it is important to have a central tool to integrate the tools, mainly to allow traceability of data.

"I think if everything was in one place, it would only be easier" (I17).

"Today we work independently with the tools, but we want to integrate our Workflow tool with our Sharepoint, in order to PMO team can register the projects for follow-up" (EFG3).

Many tools were suggested as candidates for integrator role: EPM by Microsoft, GitHub, Google Drive, Jira, Office 365, Readmine, RTC, Wiki and proprietary tools developed by interviewees' own organizations:

"The tools are integrated. I'm talking about EPM, as an isolated case, because EPM already integrates information into itself, integrates company information for all part of human resources management and gets information from that part" (I12).

"EPM generates the Sharepoint database. You create a timeline in EPM and it creates the base in Sharepoint. They already have a native integration. EPM is the old Project Web only using the Sharepoint engine" (I15).

"Yes, it's all interlinked, through Wiki from Google, you can save your Google Docs there, point to them and open the page. It's all integrated" (I7).

"We use Google tools on our own, because they are from the same vendor and they are all integrated" (I9).

"I know small companies which use Github to manage tasks, manage all the team communication, make notes of what is being done and manage the tasks of what each one has to do, the time that takes this task, the progress of the tasks, all in one place" (I17).

"We started using an integrated tool in the area, along with Office 365 to support information exchange within the team. It worked well for some time, but due to some issues, restrictions and configuration difficulties, we could not make all team members use the tool in an integrated way" (I5).

"The Atlassian products are all integrated in a task, if I click on a wiki link, it opens the page preview, and the same thing on the wiki, when I put a number of a task, it links directly to that task" (I10).

"What we use here is between Redmine and SVM. From Redmine you can see the files of that project but these files are not actually in Redmine, they are in SVM. You only put a link there and it opens in Redmine" (I17).

4.3 THEORY BUILDING

It was unanimous that to enable integration among tools, it would be necessary to have a centralized tool. Although there are no empirical studies about the effectiveness use of wiki for this role, both researchers and interviewees suggested electing a wiki as a centralized tool during the first cycle of data collection. In this case, the wiki would be the central point of communication between the user and the other tools. Besides, to assume the central role, a Wiki can be used as a document repository, such as standards and processes of areas documents.

There are evidences that many companies already use this feature to facilitate the dissemination of documents to employees (McAfee, 2006; Standing & Kiniti, 2011; Duffield & Whitty, 2015; Mansour, Askenäs & Ghazawneh, 2013; Arazy et al., 2009; Stocker et al., 2012; Gholami & Murugesan, 2011; Westbrook, 2012; Riemer & Scifleet, 2012; Richter et al., 2013; Riemer & Richter, 2010; Rosa & Chaves, 2014; Shang et al., 2011; Grudin & Poole, 2010). However, it is clear that the wiki itself would not be enough to support the project team activities.

In this sense, most respondents reported that keep project documents using at least one of productivity tools (dropbox, google drive, google docs, onedrive or sharepoint). Additionally, they use Skype or Webex for conducting project meetings, especially in the case of global projects or when the project team works in home office scheme. With respect to the blog, some participants are using blog to register lessons learned, on the other hand, most of the references indicate that the wiki is most suitable for this purpose.

WhatsApp was a tool often mentioned, especially in the focus group. Although this tool has been created recently, precisely in 2009, it is clear that it is a powerful fast communication tool among the team members. After de first cycle of data collection, a preliminary framework was created as presented in Figure 18. The project management activities pointed out in this cycle came from the literature and the first seven interviews.

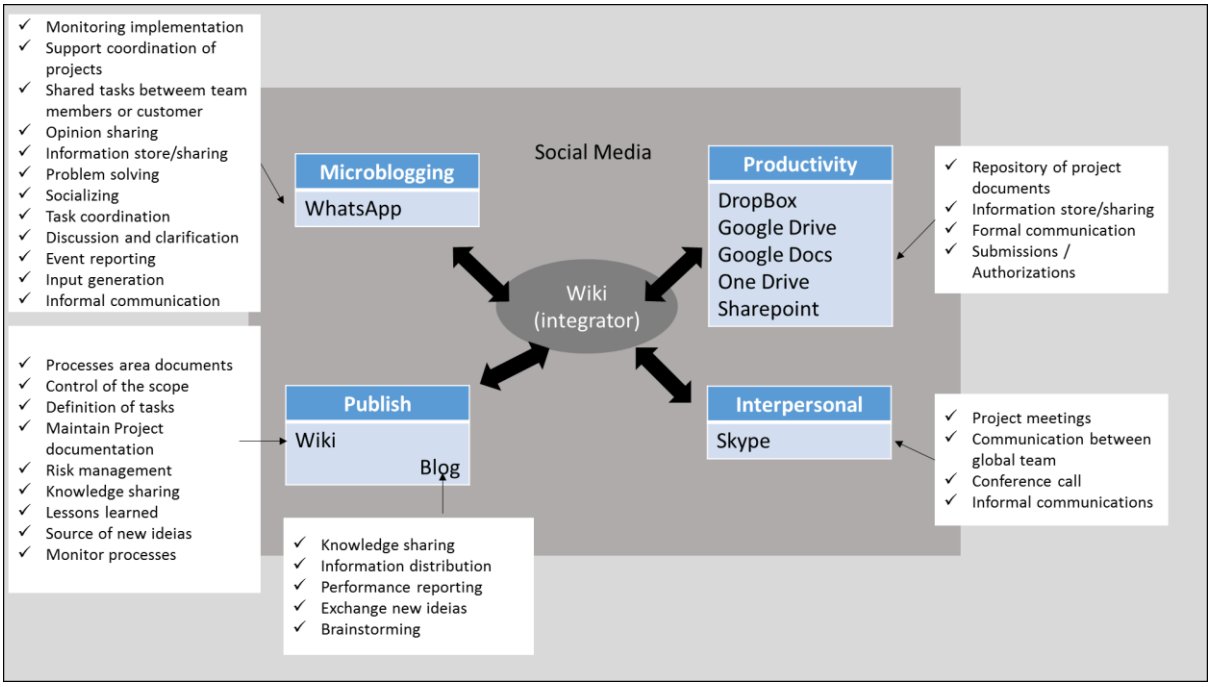

Figure 18: Preliminary framework
Source: Author

The data collection was complemented in second cycle thought new interviews, thus a new version of the framework was created. In this cycle, the name of categories was revised

and updated to better represent the PM activities, according to interviewees. This version was presented and validated during CFG meeting. During the meeting, the result of literature review was presented to permit participants compare and complement the framework based on their own experience.

4.4 LITERATURE COMPARISON

Some findings of literature review were not mentioned by the interviewees. Therefore, these finding was presented to participants of CFG to check if the purpose of use must be part of SOME4PM or not. The most part of purpose of use collect from project managers coincide with the literature, but in some cases, there were divergences. Figure 19 shows the list of purpose of use found in the literature review, do not mentioned by interviewees and the results of CFG.

Purpose of use finding in the literature review	Reported by interviewees (Y/N)	Validated by CFG (Y/N)
Control of Scope	N	N
Definition of tasks	Y	Y
Storage documents	Y	Y
Follow-up activities	N	Y
Share knowledge	N	Y
Manage lessons learned	Y	Y
Communicate, collaborate	N	Y
Access critical workplace issue	N	N
Support risk management	N	N
Online collaborative projects	Y	N
Information distribution	Y	Y
Exchange new ideas and brainstorming	N	N
Interaction between team members	N	Y
Share tasks	N	Y
Share opinion	N	Y
Share information	N	Y
Solve problems	N	Y
Socialize	N	Y
Coordinate tasks	Y	Y
Make decisions	N	P
Capture knowledge instantly	N	Y

Figure 19: Comparison of literature

Note: Y-Yes, N-No, P-Partial
Source: Author

Part of findings in the literature coincided to interviewees' experience, that are: Definition of tasks, storage documents, manage lessons learned, information distribution and coordinate tasks. All these items were validated by CFG so these are included in the framework. Other purposes found in the literature were not mentioned by interviewees, but the participants of CFG agreed to include them in the framework. The items that are part of this group are: Follow-up activities, share knowledge, communicate, collaborate, interaction between team members, share tasks, share opinion, share information, solve problems, socialize and capture knowledge instantly. On the other hand, the items: control of scope, support risk management, exchange new ideas and brainstorming were found in the literature, but the participants of CFG were not agreed to include them in the framework.

Although of social media allow the control of the scope, one of the participants pondered that, depending on the tool, it may not have adequate control, anyone can edit the information and this could pose an organization information in risk. However, there was disagreement on the part of another participant who reported that some social media has control and permit versioning. In this case, as there was no consensus during CFG, this item was not considered in the framework.

"A Wiki can do a lot of things, but there are things I would not risk doing with it. For example, the Wiki has no control, anyone can edit, so there is something that, for example, controlling scope, communication, collaboration and critical issues, are things I would not use the Wiki" (CFG6).

"In case of scope control, imagine that someone has placed a text there, hence another one and decides to change the text, as it understood differently. Then you lose the information." (CFG4).

"But in Wiki you have options to limit control, to appoint a mediator that releases, you have a number of features to avoid this kind of thing. There is a versioning of publications." (CFG2).

Make decision was mentioned in the literature, but the participants of CFG ponded that depending on the type of decision, criticality, complexity and impact of that decision in the business the use of social media cannot recommended.

"The world may be falling, but if it's a decision involving thousands, I will not answer Whatsapp, I'll want to talk. So it depends on the criticality, the level of that decision. So it may

even be put, but I think it fits that parenthesis. It depends on criticality, complexity, impact" (CFG6).

Figure 20 illustrates the final version of prescriptive framework for integrated use of social media in PM, named SOME4PM. The center of this framework represents the integration of social media classified within four categories (communication, control, dissemination and repository) to act as integrator of them. The proposal of this framework is to show that social media can be integrated through one or more social media. A list of social media can meet one or more categories. Each of them can be used for one or more categories, depending on the purpose of the use. The list of purposes represented in this framework contains examples of PM activities identified during data collection of this research, so it can vary according to each organization. The integration can be implemented through a link to social media or can contemplate a complex solution, involving the development of applications.

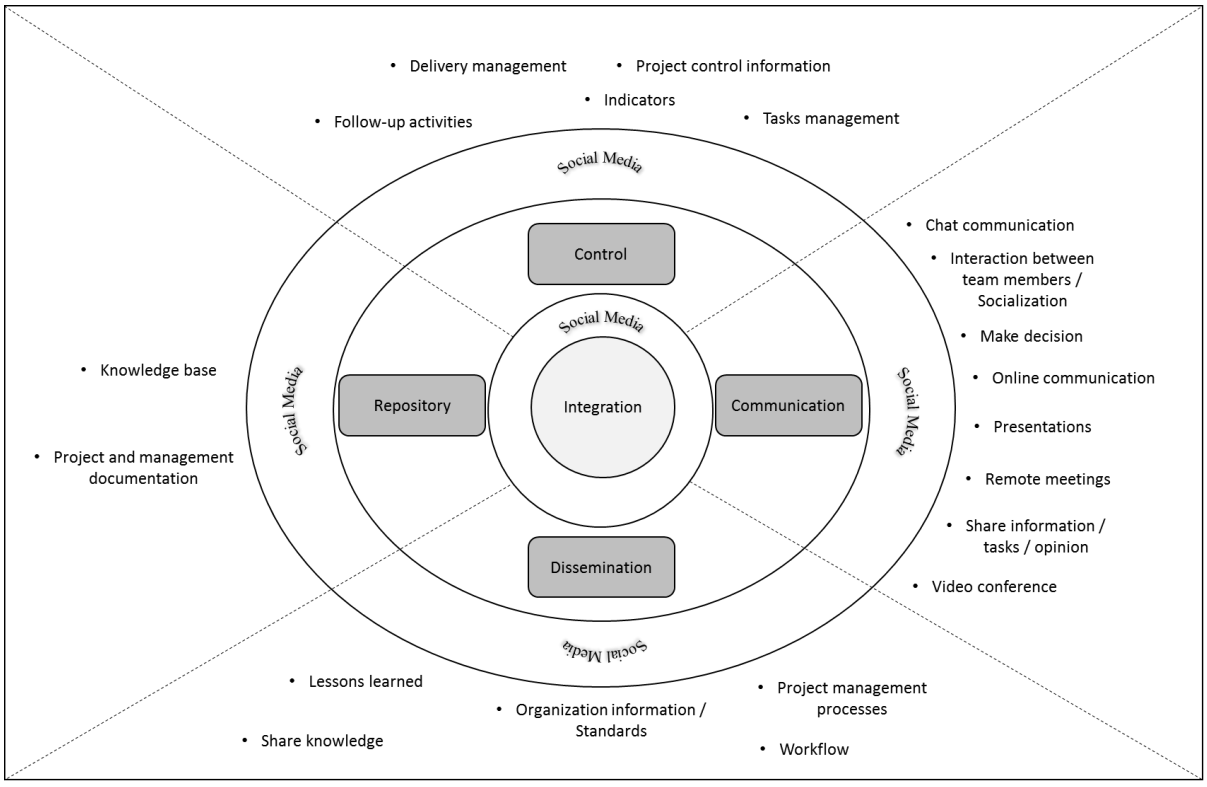

Figure 20: SOME4PM: A Prescriptive Framework for Guiding Integrated Use of Social Media in PM
Source: Author

5 DISCUSSION

The understanding of social media integration was clarified in the second cycle of analysis. In the first cycle, only the Wiki was cited as a tool that could play the role of integration with the other tools. In the second cycle, other tools were cited, such as: Jira, EPM, Git Hib and others. The success of the use of social media in project was achieved when everyone on the project used the same set of tools (Kerzner, 2015).

Therefore, after deepening of this discussion, during the CFG, it was confirmed the importance of integrating social media, mainly to ensure the integration and traceability of data. This integration can be done through a tool that allows only a link to the other tools or can contemplate a more complex solution, integrating the information of the tools. It is worth mentioning that the solution of integrating information using various social media requires time and investment by the organization. According to the participants, the use of a common set of tools, regardless of the integration between them would bring significant benefits to the organizations, in terms of agility, communication, sharing and information collaboration. Therefore, their use does not depend on an integrated solution.

Additionally, the use of social media involving decision making or knowledge sharing must be done carefully. Based on participants of CFG opinion, if a decision involves a high degree of complexity or risk, the use of social media for this purpose is not recommended. The knowledge of the resources of the tools and the conscience about the benefits that these tools can provide in PM can be a crucial step to effective use of social media in PM.

Social networking tools, as Facebook and LinkedIn were not considered in the framework, since most of the interviewees reported that this type of tools would not be adequate for the companies where they work. They emphasized that these tools could be useful in communication, depending on its purpose and the type of organization, for example, could be used in a vendor company for product disclosure.

Many concerns were exposed by interviews about the use of social media in PM. The main concern is related to information security. Most reported that the use of social media could expose confidential information of the company. In order to avoid it, they suggested assigning a responsible for approving the information before its sharing. Another concern pointed out was the quality of information, because not all team members have discernment of what should be exposed through these tools. In additional, some people feel exposed when they publish information on social media, especially when it refers to lessons learned. Another critical

success factor identified was the lack of knowledge about the resources of the tools. Thus, there is resistance of their use. Finally, the cultural aspects of each company can influence the use of the social media.

According to the interviewees, the understanding of the resources of each social media available in the market, along with actions to raise awareness of a common set of tools, represent a powerful instrument for conducting projects in organizations. In order to implement this framework in an organization, it is important highlight some critical success factors as senior management support, social media technical knowledge and training.

The advice given by respondents was related to the importance to know the features of each tool and their appropriate use by team. Thus, the more the tools are exploited, most PM activities they can cover by them. According to the interviews, it is fundamental choice a set of tools to each type of project besides the maturity level of the team members.

6 THEORETICAL AND PRACTICAL CONTRIBUTIONS

5.1 Theoretical Contributions

The contribution of an academic study can be classified into two dimensions: originality and utility (Corley & Gioia, 2011). In terms of originality, the research must to present new theoretical insights that advance existing knowledge. This research adds to the literature SOME4PM - a prescriptive framework of integrated use of social media in PM

On the other hand, utility represents a value-added contribution that must contribute as useful insight. In that line, the categories communication, dissemination and repository can be compared to interpersonal, publish and productivity defined by Safko (2010).

Scientific researches should provide original insights about a phenomenon (Corley & Gioia, 2011). While most of the studies found in the literature so far report the adoption of a single social media tool or several individual, separate tools (Popescu, 2014), this study is the first to propose the integrated use of social media to support PM activities. As a result, it introduces a new solution to traditional problems in the PM field.

Much of the organizational knowledge is distributed in documents, processes and many of them are not explicit, it is inside the head of the collaborators. The use of social media facilitates communication and encourages the sharing of information. Thus, as the framework proposes different ways of using these tools, it collaborates to make explicit the information and consequently facilitates the management knowledge of organizational as a whole.

5.2 Practical Contributions

Focus groups and interviews permitted to the researcher stimulate debates among experts about their problems in real life, finding common points of view and discrepancies. This is one way to connect this research with the reality of managers.

During the interviews, participants were motivated to report questions about advising, strength, weakness, and critical success factor for the use of PM media. According to the participants, the integrated use of social media in PM still needs to mature in order to reach its full potential. Lack of knowledge of the potential of tools is a barrier to effective use of social media. Information security, data confidentiality, the limitations of tools in terms of functionality and cultural aspects were also cited as points of attention for the use of social media in the corporate environment.

SOME4PM, as a prescriptive framework, denotes an action-oriented form of science, which is concerned with the development of recommendations on how to solve practical problems (Ahlemann, Arbi, Kaiser, & Heck, 2013). As a practical contribution, I complement the framework with examples of social media that can be helpful for PM activities classified by categories of use. It is important to emphasize that due to technological evolution, the list of examples of social media presented in the framework, contains the tools used currently, reported by the participants. Thus, new and better social media are emerging to play the same roles of the current ones. The focus of the framework is the categories of use and their integration and not on the social media.

This research also provides scenarios and recommendations based on interviewees reports for the effective use of SOME4PM. This framework was generated from the practical experience of project managers, which denotes a practical contribution to the Administration and PM areas. The four categories contained in the model: communication, control, dissemination and repository was grouped by a set of activities that managers and the project team perform day-to-day to conduct their projects.

The main objective of this work was to present a framework where the categories of social media could be integrated. According to the interviewees' suggestions, the integration can take place in a variety of ways, from the simple physical link to a more complex solution involving the development of applications.

Experienced PM validated SOME4PM. The framework can be generalized for use in different industries and business contexts. For each of the four categories, tools were recommended according to the responses of the interviews and focus group participants. In this sense, SOME4PM intends to serve as a framework that organizations can choose a set of tools that best fit in their needs. Figure 21 presents examples of social media that could be used in each category.

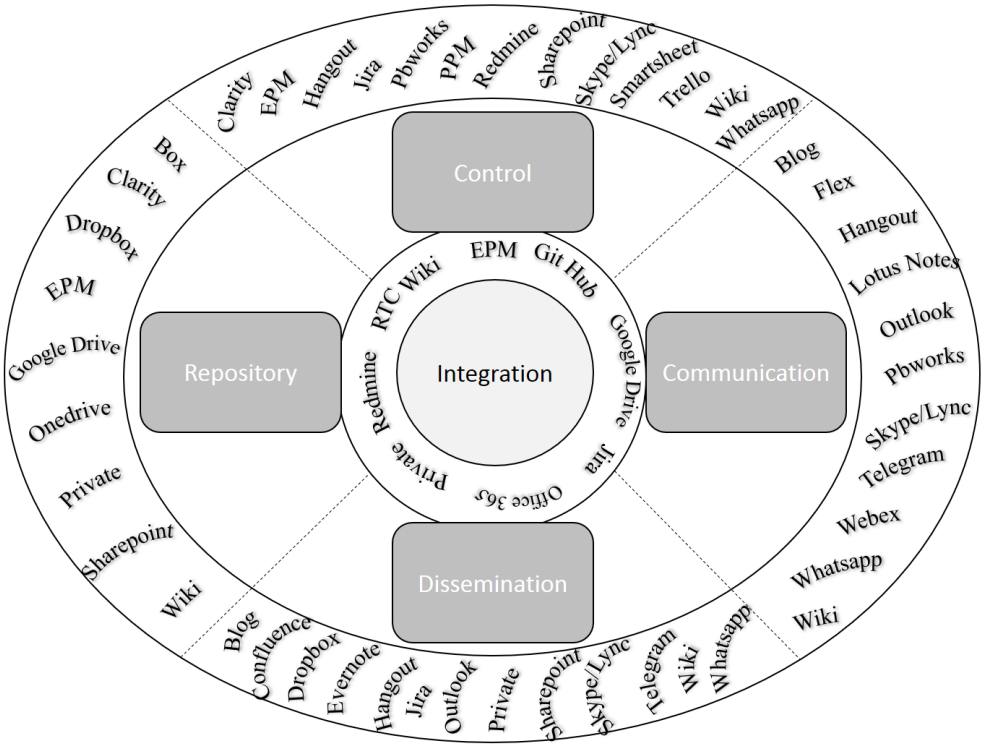

Figure 21: SOME4PM with examples of currently social media.
Source: Author

5.2.1 APPLICATION SCENARIO 1 – SMALL ORGANIZATIONS

Organizations seek solutions to improve the performance of their projects. The solutions involve improving the dissemination of knowledge, communication, project control and keep information. However, small companies usually do not have the financial resources to invest in solutions that involve software acquisition or development. Currently, there are several free social media that can fully or partially meet the needs of these companies. For this type of organization, SOME4PM can be used as support to chat/online communication, to follow-up activities, lessons learned dissemination and project documentation depending on the needs of each organization. Regardless of how many social media will be used in the solution, the most important in this case, is to make the project team aware of the common use of set of tools so the information can be shared and retrieved easily. In this scenario, the integration can occur through a tool that allows inserting physical links to the others.

5.2.2 APPLICATION SCENARIO 2 – MULTINATIONAL OR HOME OFFICE ORGANIZATIONS

Besides on to the cultural and socio-economic issues that multinational companies face, a major challenge in terms of PM is communication between the project team. Therefore, the

use of social media in the Communication category of SOME4PM is fundamental for this type of company. In addition, the correct storage of project information, dissemination of knowledge, and project control are also very relevant to the organization. Thus, organizations of this type can use SOME4PM as a whole, making use of all categories in an integrated way. Depending on the business activity, issues involving information security may vary. For example, a sales company may use a more open solution for sharing information about products and services; on the other hand, a financial company may not expose information about its projects because it deals with confidential information. The integration of social media could occur through a mixed solution. A private application could be developed by organization and play the integrator roll of all social media involve in this solution. This application could centralize the call of others social media belong the four categories or be integrated with other applications. These tools could be free or paid, depending on the level of investment of each organization.

5.2.3 APPLICATION SCENARIO 3 – LARGE ORGANIZATIONS

Large organizations have great concern with security, storage and control of information. The difference of this type of company for the smaller ones is that they usually have more capacity of investment. Therefore, for this scenario could be adopted the same solution proposed in scenario 2, adding requirements to ensure information security. It could also be contemplated the creation of a database for the storage of information registered in social media. Thus, it would be possible to track and retrieve the data recorded of each project. Another solution could be involving the creation of private applications that would play the role of existing social media frees. In this case, the applications could be customized according to the needs of each company. The point of attention in this case is that, in addition to the cost, the development time would be much longer.

7 FINAL CONSIDERATIONS

The main objective of this research was to **develop a prescriptive framework for guiding the integrated use of social media to support PM**. The specific objectives of this study were: a) Identify the use and the potential uses of social media in PM; b) Verify how the social media can be integrated to support PM; and c) Validate the framework for guiding the integrated use of social media to support PM.

In order to answer the first objective, I interviewed project managers and I realized a EFG, involving over twenty-four PM professionals. Moreover, I performed a hermeneutic literature review to establish links between the different perspectives about the use of social media in PM. Results show that the same social media can be used in distinct categories. Furthermore, the social media can contribute in PM, especially in agility communication between team members. However, most of the studies found in the literature so far report the adoption of a single social media tool or several individual, separate tools (Popescu, 2014).

Regarding the second objective, I propose three different scenarios of SOME4PM use. Each scenario contains a suggestion to how integrate the social media, depending on the type of organization. Finally, in response of the third objective, I performed a CFG involving more seven project managers. All the CFG participants validated the framework.

Initially, the idea of this research was to propose a framework for managing IT/IS projects, because the researchers believe that professionals from this area could be less resistant to the use innovative technologies. Thus, most interviewees were from IT/IS area. However, I did not identify any specific item to restrict SOME4PM for IT/IS area. So, SOME4PM can be implemented in other areas within PM. This framework includes the integration of four categories of the use of social media: communication, control, dissemination and repository.

Thus, a limitation of the study was that most respondents work in IT/IS area. As a suggestion for future work, it is recommended to repeat the interviews with professionals from diverse areas. Another limitation was that, despite being found evidence both in literature and in interviews about the importance of an integrated tool that makes communication with the other tools, it was not possible to prove the real effectiveness of this. Hence, it is suggested that a further research focus on implementation of an integrated tool was performed. In this same vein, empirical studies on the integrated use of social media in PM can generate practical contributions to the area of administration and PM.

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APPENDIX A – LITERATURE REVIEW DETAILS

Social media	T/P	Research Method	Use/Findings	Authors
Wiki	T	Literature Review	Control of the scope, the definition of tasks, storage and documentation of recovery, for collaboration and discussion, and follow-up activities.	(Chaves, Tessi, Winter, & Damasceno, 2015)
	P	Qualitative Case study	A successful wiki usage is reported in a banking.	(McAfee, 2006)
	P	Qualitative Multiple case study	Stress the use of wikis for innovation.	(Standing & Kiniti, 2011)
	T	Literature Review	Use of wiki to enhance the learning process.	(Parker et al., 2007)
	T	Literature Review	Propose an agile risk-management framework for global IT project settings using Wiki to communicate, collaborate and access critical workplace issues.	(Lee & Baby, 2013)
	T	Theoretical study	Propose a framework based on a wiki to support risk management in PM.	(Câmara, Chaves, Soares & Tessi, 2015)
	T	Multiple case study	Propose a framework for the Wiki adoption in the knowledge sharing and management process through lessons learned.	(Grace, 2009)
	T	Literature review	Consider wiki as an innovative alternative technology to process management lessons learned.	(Veronese, 2014)
	P	Qualitative Literature review Focus group	Suggest the use of wikis to support the dissemination and application of lessons learned from projects.	(Duffield & Whitty, 2015)
	P	Qualitative Interviews Field visits Documents	Present an empirical analysis of the role of wiki affordances in organizing practices.	(Mansour, Askenäs & Ghazawneh, 2013)
	P	Qualitative In depth empirical study in a large organization	Little information is available about the success of the usage of wikis in PM, in term of user satisfaction, impact on the job and impact on the organization.	(Arazy et al., 2009)
	P	Qualitative Multiple case study	Explicit and detailed illustration and cross-case analysis of three examples of wiki appropriation and usage that help to understand how the wiki was used in the context of a concrete practice and how it is connected to a concrete goal.	(Stocker et al., 2012)

Social media	T/P	Research Method	Use/Findings	Authors
	T	Theoretical study	Use a Wiki interface as an integration platform for Web 2.0 applications and secure data access.	(Polaschek, Zeppelzauer, Kryvinska, & Strauss, 2012)
	T	Theoretical study	Team members have used Wiki platforms as a practical, economical option for producing and maintaining project documentation.	(Louridas, 2006)
	P	Quantitative Survey	Use of wikis to collaborate with team members in a distributed software team (many-to-many collaborative tool), information repository, documentation repository, source of new ideas, workflow management and to monitor processes.	(Gholami & Murugesan, 2011)
Blog	T	Literature review	They concluded blogs are very useful especially in online collaborative projects and can be used for knowledge sharing and feedback, information distribution, performance reporting, and social dynamics that seek to support PM.	(Chaves et al., 2015)
	T	Literature review	Consider blog as an innovative alternative technology to process management lessons learned.	(Veronese, 2014)
	P	Qualitative Case study	Blog have been used by librarians as tools for collaborative scholarly publication and knowledge management.	(Westbrook, 2012)
	T	Literature review	The challenges of implementing blogs within organizations can be overcome through properly training to staff informing their organizational benefits. Thus, the authors present a set of guidelines for companies considering using internal blogs.	(Baxter et al., 2010)
	P	Quantitative Survey	Use of blogs to collaborate with team members in a distributed software team (one-to-many collaborative tool), to find and exchange new ideas and brainstorming and promote interaction between team members or customer.	(Gholami & Murugesan, 2011)
Microblogging	P	Qualitative Literature review	Use of microblogging to support coordination of projects, mainly shared tasks and parallel work between people.	(Riemer & Scifleet, 2012)
	P	Qualitative Interviews	Use of the freemium web service Yammer to implement enterprise	(Richter et al., 2013)

Social media	T/P	Research Method	Use/Findings	Authors
			microblogging in an insurance company. They found that the usage of microblog is concentrated in four main categories: opinion sharing and discussion, information sharing, problem solving and socializing. Also, they identified the following uses for the microblogging tool: task coordination, time coordination, discussion and clarification, event reporting, input generation, informal communication, information store, and problem solving	
	P	Qualitative Case study	Usage of the Communote tool to task coordination, provide update on context and events, share information, solve problems, share opinions and discussion, and make decisions.	(Riemer & Richter, 2010)
	T	Theoretical study	Proposes evaluating the use of microblogs in the task of recording the lessons learned from the projects.	(Cleveland, 2012)
	T	Literature review	Using microblogging to capture knowledge instantly through personal notes, reflection, stories and lessons learned. Also, they investigate the quality of this knowledge.	(Cleveland & Ellis, 2013)
Integrated use of social media	T	Literature review	Most of the studies found in the literature so far report the adoption of a single social media tool or several individual, separate tools.	(Popescu, 2014)
	T	Literature review	Use of web 2.0 technologies such as wiki, blog, microblogging, web-based office suite, social network and RSS for support lessons learned processes.	(Chaves & Pedron, 2015)
	T	Theoretical study	Use a wiki as integrate blog and RSS to support lessons learned processes	(Chaves, 2013)
	T	Theoretical study	Use of social media to support meetings and knowledge sharing in Scrum framework.	(Glória et al., 2014)
	P	Qualitative Questionary	Social media can help knowledge management in IT projects nationwide.	(Rosa & Chaves, 2014)
	T	Theoretical study	Blogs, wikis, and other second-generation tools stimulate communication and collaboration. Thus, they provide an enormous potential for improving existing PM practices.	(Filev, 2008)

Social media	T/P	Research Method	Use/Findings	Authors
	P	Qualitative Literature review Content review Interviews	Relationship between Web 2.0 technologies and Knowledge Management.	(Shang et al., 2011)
	T	Literature review	Web 2.0 concepts and technologies need to be integrated via a single interface to reach their full potential	(Auinger, Nedbal & Hochmeier, 2013)
	T	Theoretical study	Depending on the purpose of use, all technologies each have a particular contribution to the sharing of information. However, to achieve its potential they must be integrated using a single interface.	(Polaschek et al., 2012)
	T	Literature review	Propose wiki platform as a centralized repository of lessons learned collected during the entire project life cycle. The blog and RSS technologies are built-in or embedded to facilitate LL capture and dissemination. Define and adopt a social networks model to promote communication and dissemination of knowledge.	(Chaves & Veronese, 2014)
	P	Quantitative Interviews Survey	Aspects to be considered in the implementation of social media: a) aligning the expectations of managers and employees; b) organization of content and flexibility to changes of this content over the long term; and c) implement a corporative culture.	(Grudin & Poole, 2010)
	T	Theoretical study	Conclude social media are implemented by exclusive way on different tools so do not permit data integration across the tools.	(Lanubile, Ebert, Prikladnicki, & Vizcaíno, 2010)
General use of social media	T	Theoretical study	Propose a guide to manager software projects using the collaborative environment.	(Franky, 2011)
	T	Literature review	Propose the use of web-based social media for virtual PM to work, share and measure performance in the virtual environment.	(Raisinghani, Arora, Baylor, & Brown-Philips, 2010)
	T	Theoretical study	Web 2.0 applications have become common in open source and global software projects mainly in informal communication exchanged among team members.	(Lanubile et al., 2010)

Note: 'T' stands for Theoretical Contribution and 'P' stands for Practical Contribution
Source: Author

APPENDIX B – INTERVIEW PROTOCOL

1st Cycle

	No. #	Main Questions	No. #	Complementary Questions
Part I: Interviewee profile	1	Interviewee ID number (internal control)		
	2	What is the main activity area of your company?		
	3	How big is your company in terms of number of employees?		
	4	What is your role? Tell me about the hierarchical levels of your company and what is your decision level (approve participate, inform or execute)		
	5	How old are you?		
	6	How many years of experience do you have in the IT area?		
	7	How many years of experience do you have in the management of projects?		
Part II: Semi-structured interview questions	8	Does your company use some any best practices guides do PM? If so, which ones? (PMI, ICB, etc.)		
	9	Considering that there are different types of Web 2.0 tools such as those for file sharing (dropbox, google drive, etc.), others for collaborative editing, such as google docs, and others for communication (Wiki, Blog, etc.), which are those you use and for what purpose? (personal or professional)	9.1	Do the tools you use either are paid or free?

	No. #	Main Questions	No. #	Complementary Questions
			9.2	In what moment do you use the Web 2.0 tools in your IT projects?
			9.3	What kind of information or artifacts are stored in the tools?
			9.4	Considering your Web 2.0 tools experience, which one do you consider most important to PM?
			9.5	What are the strengths and weaknesses of these tools?
			9.6	The adoption of Web 2.0 tools is used in all the projects your company? If not, in which types of projects are used?
			9.7	How is assigned the responsible to use the tools? Who can store, edit, and view the information?
			9.8	Have the tools users attended to specific training? How long did it?
			9.9	In your opinion, what is the perception of the team members about the use of Web 2.0 tools?
			9.10	If you use more than one tool: Is there any integration between them? If so, considering your experience with Web 2.0 tools, what advise would you give to someone who intends to use Web 2.0 in an integrated way?

	No. #	Main Questions	No. #	Complementary Questions
				If not, does your company intend to use Web 2.0 tools in an integrated way?
	10	Since the advent of Web 2.0 tools, do you consider viable its use in IT projects of your company? Why?		
	11	What are the critical success factors do you consider essential for your company to adopt or to increase the intensity of use of Web 2.0 tools to support the management IT project?		
	12	Would you like to ask me something or complement some information about the subject we have talked?		
	13	Do you allow to available this interview data to other researchers?		

2nd Cycle

Contextualization

"Social media" is a group of internet-based applications founded in Web 2.0 which permit the creation and exchange of information between users (Kaplan & Haenlein, 2010). According to Safko (2010), there are different social media categories, such as:

a) Publish: Publishing is a broad category that includes tools that facilitate e-mail campaigns, blogging, and wikis;
b) Microblogging: Corresponding the ideal tools to communicate something important or meaningful in less than 140 characters (e.g. Whatsapp, twitter);
c) Productivity application: This is a bit of a catch-all category, but the common denominator to all of these tools is that they enhance business productivity in one way or another (e.g. Dropbox, Google drive, OneDrive);
d) Interpersonal: Tools in this category facilitate people-to-people communication and collaboration (e.g. Skype).

The focus of this interview is to explore the use of these tools in the context of PM by you and your company. Before I start, I would like to ask you if you permit the record the interview.

Interviewee profile

1. Interviewee ID number (internal control)
2. What is the main activity area of your company?
3. How big is your company in terms of number of employees?
4. What is your role? Tell me about the hierarchical levels of your company and what is your decision level (approve, participate, inform or execute).
5. How old are you?
6. What is your expertise area?
7. How many years of experience do you have in PM?

Questions

8. Does your company use any PM best practices guides? If so, which ones do you use?
9. Do you use any social media during the PM? If so, which ones do you use and for what purpose?
10. Does your company use others tools besides those you mentioned? If so, for what purpose?

Note: The questions 11 to 18 must be ask to interview only if the questions 9 or 10 was positive.

11. Do the social media you use either are paid or free?

11.1. If paid,

11.1.1. Do you have any idea of the acquisition cost of these social media?

11.1.2. In your opinion, why your company decide acquire a paid social media instead of a free?

12. In what moment do you use social media in PM?
13. What kind of information or artifacts do you store in the social media?
14. What are the social media that you consider most important for PM?
15. What are the strengths and weakness of social media use in PM?

16. The adoption of social media is in all the projects your company? If not, in which types of projects are used?
17. How is assigned the responsible to use the tools? Who can store, edit, and view the information?
18. Have the tools users attended to specific training? If so, how long did it?

Note: The question 19 must be asked only if interview use more than one social media.

19. Considering you use more than one social media, is there any integration between them?
    19.1. If so, how do you integrate them? Is there any social media to play the integration role?
    19.1.1. Do you have any lessons learned registered during the social media integration process?
    19.2. If not, does your company intend to use social media in an integrated way?
        19.2.1. What are the barriers to integrate the social media?
20. In your opinion, what is the perception of the team members about the use of social media?
21. Since the advent of social media, do you consider viable their integrated use in PM? Why?
22. What are the critical success factors do you consider essential for your company to adopt or to increase the integrated use of social media in PM?
23. Would you like to complement some information about the subject we have talked?
24. Do you allow to available this interview data to other researchers?

APPENDIX C – FOCUS GROUP STATEMENT OF CONSENT

FREE AND INFORMED STATEMENT OF CONSENT

Search Title: A Framework for Guiding Integration of Social Media in PM
Principal Researchers: Marcirio Silveira Chaves / Rosária de Fátima S. M. Russo
Assistant Researcher: Miriam Naomi Ikemoto

1. **Nature of the research**: You are being invited to participate in this research that aims to define a framework for guiding integration of social media in PM.
2. **Selected Participants**: Six project managers that use social media for business purposes.
3. **Involvement in the research**: When you participate in this study, you will allow the researcher Miriam Naomi Ikemoto to use the data collected during the focus group meeting for this research. You are free to refuse to participate and still refuse to continue participating in any phase of the research, without any damage to Miriam Naomi Ikemoto. Whenever you want, you can ask for more information about the research project by the researcher phone.
4. **About the interview**: The interview will be conducted through focus group meeting.
5. **Risks and discomforts**: Participation in this research does not bring legal complications.
6. **Confidentiality**: All the information collected in this study is strictly confidential. Only the researcher and the advisor will have knowledge of the data.
7. **Benefits:** When you participate in this study, you will have no direct benefit. However, we hope this study can provide important information about the use of social media in PM. The knowledge will be built from this research may generate a practical contribution to the PM area, so the researcher commits to disseminate the results.
8. **Payment**: You will not have any expense to participate in this research, also, nothing will be paid for your participation.

After these clarifications, we request your free form of consent to participate in this research. So fill, please, the following items.

Note: Do not sign this term if you still have doubts about the research.

Free and Informed Consent

According to the items presented, I, free and informed way, manifest my consent to participate in this research. I declare that I have received a copy of this consent form, and I authorize the research and dissemination of data obtained in this study.

_____
Participant Search Name

_____
Participant Search Signature

_____
Researcher Signature

_____
Advisor Signature

Principal Researchers: MARCIRIO SILVEIRA CHAVES (11) 3665-9321
ROSÁRIA DE FÁTIMA S. M. RUSSO (11) 3665-9321
Assistant Researcher: MIRIAM NAOMI IKEMOTO / (11) 9-9692-8323

APPENDIX D – EXPLORATORY FOCUS GROUP PROTOCOL

Category question / expected time	**Question**
Drivers / Facilitators and barriers of social media used in PM (10 min.)	1. In your opinion, what are the critical success factors for the effective use of social media?
	2. What actions should companies take to start or increase the use of this technology?
Use of social media in PM (15 min.)	3. Do you use social media in PM? (15 min.)
	4. If so, what are the names of the tools?
	5. In which PM processes or design avid cycle are used?
	6. What kind of artifacts are generated, stored or used?
	7. In addition to these tools that are designed, do you use other tools for managing IT projects? For what purpose? What is the name of these tools?
Integrated use social media in PM (+- 45 min.)	8. Do you use any of these tools in an integrated way? How is this integration?
	9. Considering your experience with managing IT projects and the potential of social media related to agility in communication, collaboration and information sharing, as these tools could be better exploited in an integrated manner?
	10. Does your company use some PM tool? If any Web 2.0 tool could be integrated into this tool, do you think you it could bring any benefits?
Closing (10 min.)	11. Do you believe that the subjects we discussed in this session about the use of social media is restricted to IT projects or can be applied to management of any type of project?
	12. Do you have something to add about this subject?
	13. Do you agree to share such information for other researchers?

APPENDIX E – CONFIRMATORY FOCUS GROUP PROTOCOL

Category question / expected time	**Question**
Profile of focus group member (10 min)	1. What is the main activity area of your company? 2. How big is your company in terms of number of employees? 3. What is your role? Tell me about the hierarchical levels of your company and what is your decision level (approve, participate, inform or execute). 4. How old are you? 5. What is your expertise area? 6. How many years of experience do you have in PM?
Purpose of use category (10 min)	7. According to interviewees, 4 categories were identified. Do you agree with all these categories? Do you have any suggestion to increment this list? ✓ Control ✓ Communication ✓ Dissemination ✓ Repository
Control (10 min)	8. According to them, CONTROL tools collaborate in PM in the following ways. Do you agree with all items in this list? Do you want to complement some item in this list? ✓ Project control information ✓ Indicators ✓ Delivery management ✓ Task management ✓ Follow-up activities
	9. The tools mentioned in this category were: EPM, Clarity, Head Mining, Trello, Pbworks, Skype, WhatsApp and Hangout. In your opinion, which ones can best act as CONTROL tools in PM? Why?
	10. Do you use or do you have knowledge of any other tool that can best act this role?
Communication (10 min)	11. According to them, COMMUNICATION tools collaborate in PM in the following ways. Do you agree with all items in this list? Do you want to complement some item in this list? ✓ Online communication ✓ Remote meetings ✓ Video conference ✓ Presentations ✓ Chat communication
	12. The tools mentioned in this category were: WhatsApp, Skype, Link, Webex and Flex. In your opinion, which ones can act as COMMUNICATION tools in PM? Why?
	13. Do you use or do you have knowledge of any other tool that can best act this role?
Dissemination (10 min)	14. According to them, DISSEMINATION tools collaborate in PM in the following ways. Do you agree with all items in this list? Do you want to complement some item in this list? ✓ Sharing knowledge

	✓ Lessons learned ✓ PM process ✓ Forums ✓ Workflow ✓ Organization information standards
	15. The tools mentioned in this category were: Blog Wiki, Yammer, Dropbox, Evernote, Jira, Confluence and SharePoint. In your opinion, which ones can best act as DISSEMINATION tools in PM? Why?
	16. Do you use or do you have knowledge of any other tool that can best act this role?
Repository (10 min)	17. According to them, REPOSITORY tools collaborate in PM in the following ways. Do you agree with all items in this list? Do you want to complement some item in this list? ✓ Project documentation ✓ Knowledge base ✓ PM documents
	18. The tools mentioned in this category were: SharePoint, Wiki, Google Drive, OneDrive, SVM, Private, Box, Dropbox and EPM. In your opinion, which ones can best act as DISSEMINATION tools in PM? Why?
	19. Do you use or do you have knowledge of any other tool that can best act this role?
Integrator (5 min)	20. Do you think is important to have an INTEGRATOR tool to link all social media?
	21. The tools mentioned in this category were: Wiki, Git Hub and Private tools. In your opinion, which ones can best act as INTEGRATOR tools in PM? Why?
	22. Do you use or do you have knowledge of any other tool that can best act this role?
Complement from literature (10 min)	23. Some items founded in the literature were not mentioned by interviewees, as following:

Literature

How does social media contribute to IT Project Management?

Wiki

- ❖ Control of the scope
- ✓ Definition of tasks
- ✓ Storage documents
- ❖ Follow-up activities
- ❖ Sharing knowledge
- ✓ Managing lessons learned
- ❖ Communicate, collaborate and access critical workplace issues
- ❖ Support risk management

✓ Is in the model
❖ Not in the model

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Literature

How does social media contribute to IT Project Management?

- ✓ Sharing knowledge
- ✓ Managing lessons learned
- ❖ Online collaborative projects
- ❖ Information distribution
- ❖ Exchange new ideas and brainstorming
- ❖ Interaction between team members

✓ Is in the model
❖ Not in the model

MESTRADO PROFISSIONAL EM ADMINISTRAÇÃO GESTÃO DE PROJETOS

TiP 2.0

UNINOVE Universidade Nove de Julho

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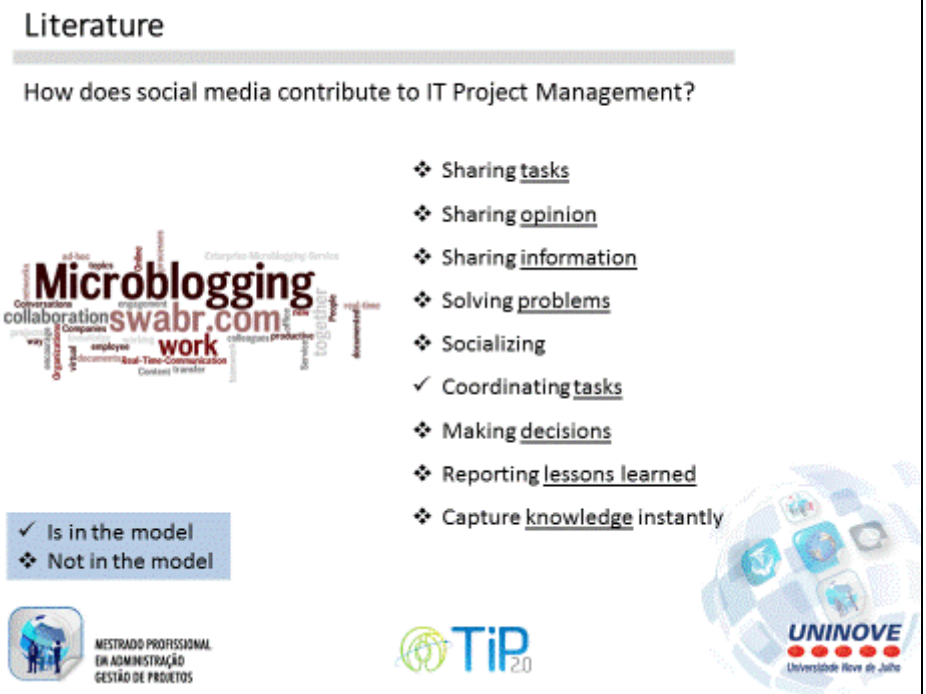

24. Do you agree with all items in this list?
25. In your opinion which these items could be aggregated in the framework?
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<td>Framework (10 min)</td>
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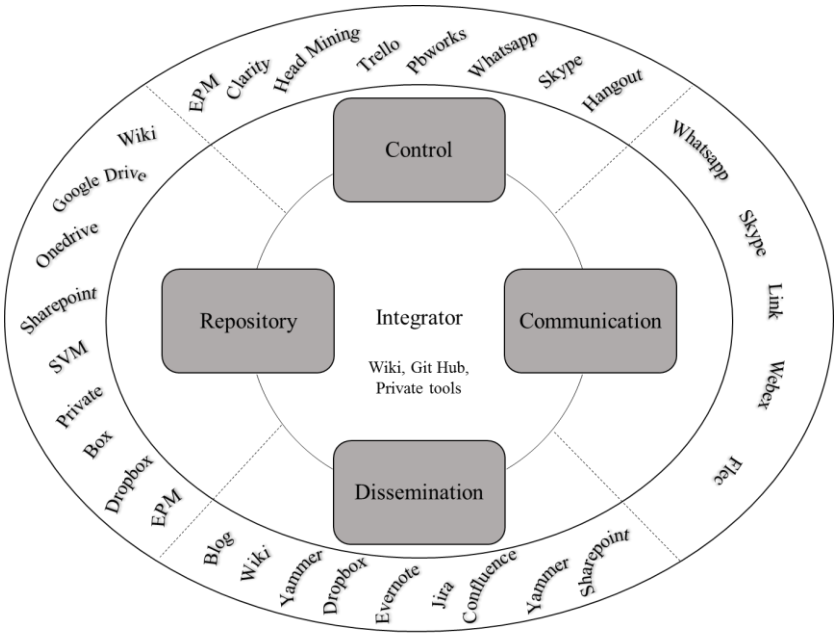

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<td>Closing (5 min)</td>
<td>27. Do you have any suggestion to complement the framework?</td>
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APPENDIX F – SOCIAL MEDIA ADDITIONAL INFORMATION

Tool	URL
Blog	https://en.wikipedia.org/wiki/Blog
Box	https://www.box.com/
Clarity (CA)	http://www.ca-clarity.com/contec-x_e/ca-clarity-ppm/overview/
Confluence	https://www.atlassian.com/software/confluence
Dropbox	https://www.dropbox.com
EPM (Microsoft)	https://support.office.com/pt-br/article/O-que-h%C3%A1-de-novo-na-solu%C3%A7%C3%A3o-Microsoft-Office-EPM-Enterprise-Project-Management-b64b2aa9-4ad3-4e75-86cf-247aec1137aa
Evernote	https://evernote.com
Flex	https://apkpure.com/br/chat-flex/com.appflexa.Chatflex
Git Hub	https://github.com/
Google Drive	https://www.google.com/drive/
Hangout	https://hangouts.google.com
Jira	http://www.software.com.br/p/atlassian-jira?gclid=CjwKEAiA3qXBBRD4_b_V7ZLFsX4SJAB0AtEVFal7ZvZ56flBQfbhnpR_Dyoei6FsAv5wkoem2nfPsRoCIM7w_wcB
Lotus Notes	https://www-01.ibm.com/software/br/lotus/products/notes/
OneDrive	https://onedrive.live.com
Outlook	https://outlook.office365.com
Pbworks	http://www.pbworks.com/
PPM (HP)	http://project-management.softwareinsider.com/l/554/HP-PPM
Private	Private tools developed by the organizations in order to support specific necessities
Redmine	http://www.redmine.org/
Sharepoint	https://products.office.com/pt-br/sharepoint/collaboration
Skype / Lync	https://www.skype.com / https://products.office.com/pt-br/skype-for-business/online-meetings
Smartsheet	https://pt.smartsheet.com/
Telegram	https://telegram.org/
Trello	https://trello.com
Webex	https://www.webex.com/
Wiki	https://en.wikipedia.org/wiki/Wiki
Whatsapp	https://www.whatsapp.com/