

# **A Framework for using Social Media in the Practice of Project Management**

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## Abstract

Project management theory and practice are evolving rapidly. This research, prompted by developments in social media and mobile technologies, makes a contemporary contribution to the field of project management.

Social media are transforming business and many aspects of society, yet project management practitioners are divided on the impact of such technologies. Research on the use of social media in project settings is limited and tends to be influenced by a conventional deterministic view of project management that ignores the complexity of human interaction in projects. In contrast, the research reported here adopted a socio-technical perspective. A new definition of project management practice was developed that brings human interaction to the fore. Project communication, usually considered to be either internal or external, was conceptualised in a new framework of three zones.

This research examined how digital natives, whose experience of using social media pre-dates their experience of project management, use social media to manage projects. An abductive approach involving a series of unstructured interviews was used to uncover perceptions of the factors influencing use of social media, the activities where social media were deployed, and the impacts of social media. Theories imported from the disciplines of knowledge management and organisational learning have been used to show how some weaknesses in traditional forms of project management are addressed.

Empirical evidence is provided for how social media interacts with the practice of project management, adding clarity and depth to earlier work. Six types of technology are shown to be most useful for managing projects. Four types of factors – organisational, technological, team and task characteristics – are confirmed as influencing technology use and some new factors within these categories are added. Activities in all three zones of communication are revealed, included some not previously discussed. This work also extends understanding of the impacts of using social media in project settings. Seven categories of benefits and concerns are explored, with some new impacts highlighted.

Overall, the perceptions among digital natives of the benefits of using social media to manage projects far outweigh the concerns. The framework developed in this work is new and makes a contribution that can be used to create new guidance informing the deployment of social media in the practice of project management.

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## Prologue

Relatively poor rates of success are typically reported for commercial projects<sup>1</sup>. As a practitioner in the field of information systems in the 1980s, I was formally trained in project management. At that time project management literature emphasised planning and control, and the discourse was dominated by an objectivist perspective. Today, “the majority of literature still conveys an instrumental rationality” (Dalcher 2016a, p.817). In contrast, my practice of managing projects is shaped by human interaction and effective communication.

For the last 20 years I have been privileged to work with young people. My role as a facilitator of learning for project management enables me to observe students managing projects. In contrast to commercial projects, student projects are largely successful<sup>2</sup>. The management of student projects today involves a conjunction of project management practice and social media usage, and it was this observation that inspired my research.

The students of today are the project managers and project team members of tomorrow. Student projects typically involve a small team, and this can be considered a factor that contributes to success. Commercial projects are often larger, but will usually be sub-divided into smaller sub-projects undertaken by relatively small teams. Therefore studying human interaction on projects involving small teams seems likely to have wider relevance and student projects provided just such an opportunity.

In addition, as young people, students are avid and adventurous users of technology, and, I observe, often demonstrate excellence in learning. Therefore, investigating how young people use social media in managing projects was considered worthwhile and may uncover clues about the practice of project management in the future.

Karen Thompson

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<sup>1</sup> Project success is a complex, constructed phenomenon. The Chaos Report in 2015 (Hastie and Wojewoda 2015) reported 29% of IT projects were successful, using traditional measures of project success (i.e. cost, time and quality), although it is recognised that such measures have been considered mis-leading (e.g. Eveleens and Verhoef 2010).

<sup>2</sup> Assessing student projects in terms of cost, time and quality suggests a success rate in excess of 80%.

## **Acknowledgements**

Firstly, I would like to thank you, the reader, for your patience in engaging with my holistic and relational view of project management. This research has been a long and, at times, challenging journey. Thanks are due to my supervisors for helping me to unravel a complex web of connected and interconnected concepts and ideas. I am immensely grateful to my supervisor Professor Brian Hollocks who has been a constant source of sensible advice, expert guidance and support from beginning to end. Gratitude also to my second supervisor, Dr Paul Freedman, whose insights and clarity provided illumination and helped me uncover the path through a forest of ideas.

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I am also grateful to many friends who have been a sounding board for ideas along the way, and to everyone who provided words of encouragement at crucial points in my long journey; to list everyone would be to risk missing someone. If you are one of these people, I hope you recognise yourself and will accept my thanks.

## **Declaration**

I confirm all the work contained in this report is my own. During, and as part of the validation stage, the initial findings were presented twice – once at the Bournemouth Digital Project Managers Meetup meeting on 28<sup>th</sup> June 2016, and secondly at the Digital Engagement Online Conference and Workshop at Bournemouth University 29 June 2016. Subsequently the findings have been presented at a meeting of the Wessex Branch of the Association for Project Management on 16 March 2017.

Karen Thompson

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## 1 Introduction

### 1.1 The focus of this research

This research is situated within the field of project management. Project management theory and practice are evolving rapidly and the present work is located within a third wave of project management (Morris et al 2011).

A traditional approach to project management, also called the first wave, is based on a largely deterministic model and has been widely criticized (e.g. Blomquist et al 2010, Winter et al 2006b, Cicmil and Hodgson 2006, Atkinson 1999). In the second wave of project management, emphasis shifted to managing projects as whole entities. There were many efforts to increase control and best practices were developed. However, the second wave initiatives tended to reaffirm a techno-rational approach, were deemed to have “no effect” (Eveleens and Verhoef 2010, p.30) on project success, and there were calls for broader conceptualisations of project management (e.g. Winter et al 2006a). Both theoretical and practical re-considerations of project management characterise what has been called a third wave (e.g. Morris et al 2011).

In the third wave of project management, some theoretical reconsiderations of project management have led researchers

“towards understanding the specific nature of social relations, structures and processes that occur in projects“ (Florice et al 2014, p.1091).

Practical reconsiderations of the field have resulted in the development of new approaches, such as agile methods, that emphasize project communications. To date, practical and theoretical developments have tended to generate advances that are largely independent of one another (Florice et al 2014). There are calls for research on the actuality of projects (e.g. Blomquist et al 2010), i.e. what practitioners actually do when managing projects.

This work is one response to the calls for research on the actuality of projects and was prompted by the growth of mobile technologies and social media. Social media is a colloquial term referring to applications that were originally designed for social use, such as Facebook, WhatsApp and Twitter, that are transforming business and many aspects of society. Project management practitioners have expressed an interest in the use of such tools to address the communication challenges they face. For example, Harrin (2010a, p.33) states:

“You’d be hard pressed to find someone who didn’t believe that communication was a critical part of project management. And ... social media tools have communication at their heart.”

Yet, overall, project management practitioners are divided on the impact of social media. There are those who see “the perfect match” (O’Neal 2010, p. xi) but also those who ask if they are “a waste of time” (APM 2014, p.1). Hence, exploration of the interaction between social media and the practice of project management was considered worthwhile.

## 1.2 Research aim and objectives

The research can be viewed as taking place at the conjunction of project management and social media, as illustrated in Fig 1.1.

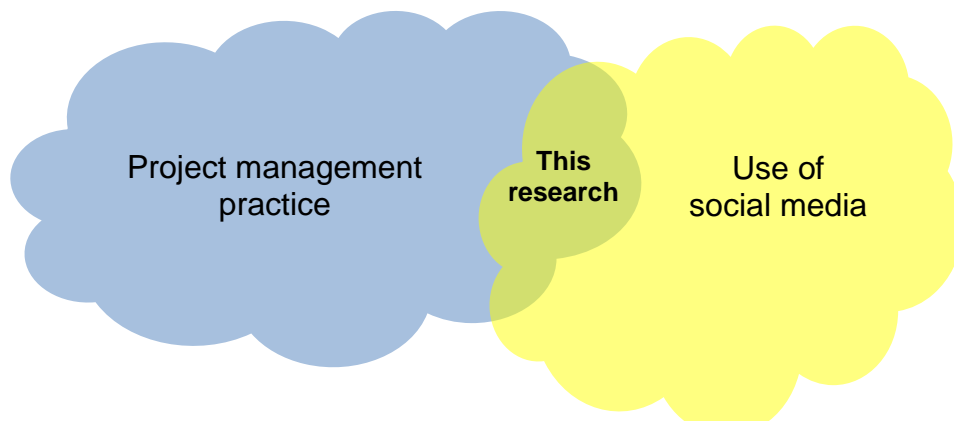


Fig 1.1 The two aspects of this research

To pursue the research, a framework was required that places social media in the context of project management practice. Therefore, the research process involved seeking a framework to provide a point of reference for understanding practice. Literature from the mature field of technology adoption was used to shape four underlying constructs:

- a. Technology types
- b. Factors that influence technology adoption and use
- c. Activities and behaviours involved in using technology
- d. Impacts of using technology.

A primary research question was developed to provide an overall aim for the work, and the four constructs were used to define four objectives, as set out below.



**Research question:**

How do social media interact with the practice of project management?

**Research objectives:**

1. To understand what social media are relevant to managing projects.
2. To investigate the factors that influence use of social media in project settings.
3. To explore the behaviours involved in using social media to manage projects.
4. To explore the perceptions of the impacts, consequences and concerns of using social media in project settings.

Next, the development of new definitions for the terms project, project management practice, and social media are presented.

### 1.3 Projects

Projects, in the sense of temporary organisational entities, have existed for millennia. The results of large scale collaboration, in other words projects as they would be called today, have been found that date back over 11,000 years, long before writing and probably even before the agricultural revolution (Harari 2011). The temple excavated at Göbekli Tepe in Turkey, where parts of the site date back to 9,500BC, is thought to be the result of a series of projects that took place over thousands of years. The construction of Stonehenge is another example of a project from pre-history. Accordingly, it has been suggested that the conception and execution of projects may be instinctive (Morris 2013).

Historically projects have been used in fields such as construction, defence, engineering and, since the development of computers, in the field of information systems and technology. Approaches to managing projects are largely based on “the traditional engineering view of projects” (Winter et al 2006b, p699) where there is a focus on outputs, such as a building, or a clearly defined outcome, such as landing a capsule on Mars. In recent years however, there has been the emergence of a new class of projects called “business projects” (ibid.) that reflect a conceptual shift “towards a more business-orientated view, in which the primary concern is no longer the capital asset, system or facility etc. but increasingly the challenge of implementing business strategy, improving organizational effectiveness and managing the realization of stakeholder benefits.” (ibid.).

The emergence of business projects and other drivers have led to a re-conceptualisation that includes recognition of projects as socially constructed, where

behaviours arise from complex interactions (e.g. Winter et al 2006a, Winter et al 2006b, Atkinson 1999, DeWit 1988). Such re-conceptualisation suggests a perspective of projects as social organisations, and a focus on human engagement and communication. From such a perspective, a project can be seen as an inter-subjective phenomenon

“that exists within the communication network linking the subjective consciousness of many individuals” (Harari 2011, p.117).

Existing definitions of a project tend to reflect a deterministic view and are therefore inappropriate for this work. The definition of a project offered by the Project Management Institute (2012) as “a temporary endeavor (sic.) undertaken to create a unique product, service or result” is focused on the output or outcome and is therefore too limited. Morris’ (2013, p.12) notion of an undertaking “to realize an idea”, and Turner’s (1999, p.3) concept of turning “vision into reality”, both embrace the inter-subjective nature of a project, but do not sufficiently illuminate the concept.

Turner (2014, p.20) defined a project as:

“a temporary organization to which resources are assigned to do work to bring about beneficial change”.

His definition highlights organisation, resources and change, but the emphasis on work fails to recognise the role of human interaction and communication.

A social organisation was defined by Boulding (1956, p.205) as “a set of roles tied together with channels of communication” and this highlights the role of communication. The term “organisation” in Turner’s (2014) definition is replaced with Boulding’s (1956) earlier definition in Thompson’s (2015, p.1) definition of a project as:

“a temporary inter-subjective phenomenon that exists within the communication network of many individuals to which resources are assigned to do work that brings about beneficial change.”

In this definition, the expression “assigned to do work” is seen as limiting the notion of a project to the work that is undertaken and fails to recognise adequately the role of subjective elements, such as perceptions, values and beliefs. Hence, for the present work, a new definition of a project has been created:

**A project is defined as a temporary set of roles tied together by channels of communication to achieve purposeful change.**

## 1.4 Project management

Although humans have undertaken projects for millennia, no notion of a formal discipline of project management existed until the 1950s (Morris 2013). Since then, the tools, techniques, language and concepts of project management as it is recognized today began to be articulated. Many of the tools and techniques in use today are largely based on an engineering model of a project that emphasizes planning, monitoring and control. An engineering view of project management, known as the traditional or classical approach, is instrumental and rationalistic in nature. The dominant discourse in the field of project management reflects a largely deterministic perspective (e.g. Williams 2005), that has become prescribed in bodies of knowledge and retains a hold on parts of the profession, as noted recently:

“the majority of the literature still conveys an instrumental rationality associated with a prescriptive model ...” (Dalcher 2016a, p.817)

From the 1980s onwards mainstream approaches to project management have been widely criticized (e.g. Blomquist et al 2010, Winter et al 2006b, Cicmil and Hodgson 2006, Atkinson 1999, to name but a few). Mainly since 2006 and continuing today (Svejvig and Andersen 2015) there has been a stream of literature around re-thinking project management that has addressed the field from a range of perspectives (e.g. Blomquist et al 2010, Cicmil and Hodgson 2006, Winter et al 2006b). However, a deterministic approach to project management continues to be reflected in modern definitions of project management. For example, the UK’s professional association, the Association for Project Management (APM) define project management as:

“the application of processes, methods, knowledge, skills and experience to achieve the project objectives” (APM 2012, p.241).

Turner’s (1999, p.3) definition of project management as “the art and science of converting vision into reality” moves away from notions of control. The term “art”, defined here as “an activity through which people express particular ideas” (Cambridge Dictionary 2016), reflects a subjective view but does not fully recognise the inter-subjective nature of a project. Project management has not yet been defined in a way that emphasises human engagement and communication. Therefore, Turner’s (1999) definition has been extended to emphasise human interaction and communication, and a new definition of project management practice has been created for this work:

**Project management practice is the art and science of achieving purposeful change by enabling communication, coordination and integration among temporary roles to convert vision into reality.**

## 1.5 Social media and mobile technologies

This research was prompted by the growth of mobile technologies and social media. The total number of mobile phone users worldwide in 2017 is estimated to have reached 4.77 billion (Statista 2016), and the number of smartphone users is rising at a rate of 5.7% p.a. (Statista 2017). A growing number of mobile applications, called apps, have increased the time people spend online via mobile devices, and in 2016, social media platforms connected 2.8 billion people, more than 1/3 of the world population (Statista 2017). Claims made at the beginning of this decade about mobile technologies interacting with the evolution of social software to create new environments that are changing the way we do business (e.g. Daley 2010) continue, for example:

“at least 40% of all businesses will die in the next 10 years ... if they don't figure out how to change their entire company to accommodate new technologies” (Chambers cited by Statista 2017, p.2).

Keitzmann et al (2011) amongst others suggest social media are transforming the communication landscape. Within organisations the adoption of social media has attracted attention, and there is growing interest in the advantages derived (e.g. Alberghini et al 2014, Kügler et al 2013, Keitzmann et al 2011). For example, the value of connecting team members and communities within a business has been highlighted:

“social networking sites, blogs and wikis can be powerful tools for intra-team collaboration by allowing people to quickly connect, converse, create and interact in communities” (Ang 2011, p.150).

Although social media are now ubiquitous in the private realm, empirical research on social software adoption in an enterprise setting is still scarce (Kügler et al 2013). There are decades of research on physical workspaces, yet the nature of informal interactions in virtual workspaces is only just starting to be understood (Fayard and Weeks 2011).

The term “social media” is frequently used but there is no universally accepted definition (Zhao et al 2013). The term has been used as an umbrella term that incorporates applications and tools such as blogging, Facebook, LinkedIn, YouTube, shared workspaces (wikis), Twitter, Skype and sometimes text messaging, instant messaging and gaming technology.

In this work, the term social media is used to embrace an array of technological applications and equipment that are associated with social uses and depend upon the capabilities of Web 2.0

The World Wide Web, commonly known as the Web, has long been used to create and publish content over the Internet. Today, the Web provides a platform whereby content and applications can be continuously modified by users in a participatory and collaborative fashion (Kaplan and Haenlein 2010). Although the Web as a collaboration platform has been called Web 2.0, Berners-Lee (2006) has argued that the web was originally designed with such collaboration in mind. The term Web 2.0 is considered to have been coined by O'Reilly, who states:

“Web 2.0 is the business revolution in the computer industry caused by the move to the internet as platform” (O'Reilly 2006, p.1).

Collaborative technology is not a new concept, but the view taken here is that the growth of mobile technologies, combined with development of what has been called social media, represents

“if not a qualitative break or paradigm shift, then at least a disturbance of our regular ways of thinking about (and using) technologies for sharing, collaborating, learning and participating” (Ryberg 2008, p.1).

For this work, a distinction is made between technologies that enable one-to-one communication and those that facilitate communication amongst a group. Keitzmann et al (2011) suggest the term social media refers to applications that employ mobile and web-based technologies to create highly interactive platforms whereby individuals and communities share, co-create, discuss, and modify content. Zhao et al (2013) adopt a wider, more inclusive view and their definition is adopted for the present work:

**Social media are the “socio-technical systems, websites or applications that build on Web 2.0 technologies to provide space for social interaction, communication, collaboration and community formation” (Zhao et al 2013, p.290).**

## 1.6 Project management and social media

The importance of effective communication to the success of projects is well documented (e.g. Lovelace et al 2001). Some consider communication represents one of the greatest threats to project success (e.g. Samáková et al 2012). Communication can support team-building (Haywood 1998) and relational elements play a key role in

determining whether a project is judged as a success (Haried and Ramamurthy 2009). Research has produced evidence for the importance of social interaction in project environments. For example Balkundi and Harrison (2006, p.49) found that “teams with densely configured interpersonal ties attain their goals better”. Geraldi and Adlbrecht (2007, p.32) found the “predominant type of complexity perceived by project managers was the complexity of interaction”. Yet a review of project management literature concluded:

“the so-called “soft topics” – that is culture and social processes – and their influence on project management and project organisation are still underrepresented in research” (Hanisch and Wald 2011, p.15).

Project management has been suggested as suitable application for social media (e.g. Dorsey 2010), and increased use of social media by project managers has been predicted (e.g. Hollingsworth 2010). Remidez and Jones (2012) assert:

“The explosion of social media is changing the way we communicate, thus affecting the processes involved with information services supporting project management.” (ibid., p.33)

Yet, project management practitioners are divided on the impact on practice of social media.

Advocates suggest the role of social media in project management may be beneficial, as explained by O’Neal (2010, p. xi):

“One would think the level of collaboration required of project managers in their day-to-day activities and the collaborative capabilities offered by social media and networking technology would result in the perfect match.”

Harrin (2010a) explains why project managers should become involved with social media and offers practical advice to practitioners. She found social media tools used for project status updates and managing project teams, and reported efficiency benefits in the form of improved communication (Harrin 2010b). Anecdotal evidence has been used to suggest benefits in defining the ‘big picture’ for teams, encouraging information flow, providing a visual status, keeping everyone up-to-date (Hollingsworth 2010), building trust and managing stakeholder expectations (Remidez and Jones 2012). Yet, according to Harrin (2011), many senior managers still fail to see the benefits that social media tools used professionally at work can bring.

Van der Merwe (2016) suggests social media are transforming communication in projects:

“Social media is reshaping the way we manage projects, by changing the way we connect and communicate with our teams and stakeholders. Social media provides instant access to a broader audience than was previously possible through conventional communication means.” (ibid. p.139)

Practitioners such as Van der Merwe (2016), Harrin (2010a, 2010b, 2011a, 2011b) and Hollingsworth (2010) provide some suggestions for how social media can be used in a project environment. However, such suggestions are limited. Van der Merwe’s (2016) suggestions, for example, focus on virtual teams. Practitioner views are influenced by the communications practices and norms of specific organisations. In addition, the views of practitioners and their perceptions about the use of social media are influenced by traditional concepts of project management. The phenomenon of using social media to support project management is emerging but as yet, there are no models to guide understanding of the elements associated with the practice, or how the elements may influence project success (Remidez and Jones 2012).

Critics suggest that social media may fundamentally change project management for the worse by encouraging project managers to stop planning and to focus on individual issues, instead of managing the project overall (Mello cited by Hollingsworth 2010).

In 2014, the APM asked whether social media in project management was a waste of time (APM 2014). Their briefing characterises social media as:

“... technology that facilitates dynamic interaction between a group of people; the emphasis is on the ‘social’ bit. Social media is just another way of interacting with one another ...” (APM 2014, p.1)

The APM identify a range of issues and suggest solutions based on existing ways of managing projects; for example, use of social media for planning is highlighted. The potential for social to become “a powerful tool” (APM 2014, p.3) is recognised but further detail is lacking. They conclude:

“It is clear that social media has a place within project management and is ultimately just another suite of channels to do things project managers have been doing for years.” (APM 2014, p.3)

Hence, a range of different, and sometimes conflicting, views about social media amongst project management practitioners provides the rationale for this research.

## 1.7 Research overview

This research aims to develop an understanding of both technical and human components in the use of social media for managing projects. In departing from a purely technical view, social media are defined as “socio-technical systems” (Zhao et al 2013, p.290), and hence a socio-technical perspective was adopted for this work.

Chapter 2 develops the conceptual framework that is used throughout the work. First, the practice of project management is conceptualised as human interaction and communication. Next, the notion of a hyper-connected world is introduced and a taxonomy of social media is developed. The types of social media that are relevant for managing projects are identified and added to the framework, as shown in Fig. 1.2.

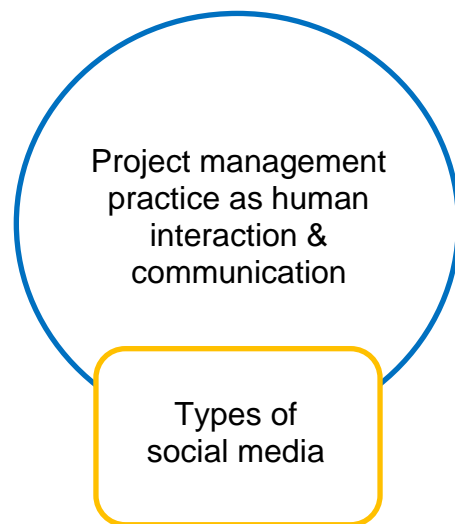


Fig 1.2 Project management and social media

Literature from the field of technology adoption is then used to identify a range of factors influencing the adoption and use of social media for project management. Next, activities involving social media for managing projects are explored and used to enhance the framework. Finally, the impacts of using social media in project management are discussed and used to extend further the framework, as illustrated in Fig. 1.3.



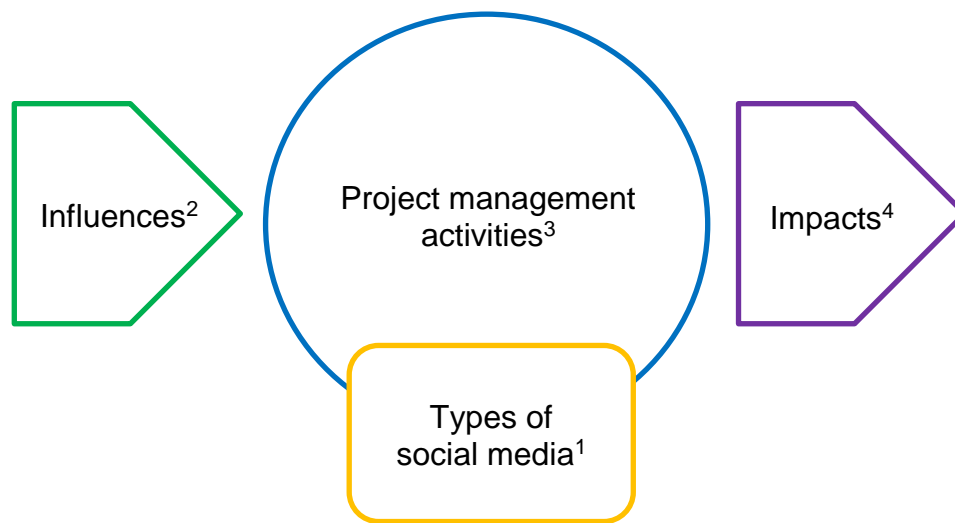


Fig 1.3 Overview of the conceptual framework for this research

The four research objectives correspond to the four aspects of the framework as follows:

1. To understand what social media are relevant to managing projects.
2. To investigate the factors that influence use of social media in project settings.
3. To explore the behaviours involved in using social media to manage projects.
4. To explore the perceptions of the impacts, consequences and concerns of using social media in project settings.

Chapter 3 sets out the research design and explains the systematic programme of data collection and analysis. The design requirements, constraints and choices are explained, thereby making visible the theoretical foundations of this work. Key features of the research were an abductive strategy, a pragmatic approach to data collection, and data analysis using recursive abstraction. Data was generated from a series of in-depth, un-structured interviews involving thirty participants over a two-year period.

This research is one response to the calls to uncover the lived experience of project practitioners. At the heart of the work is the notion that project management practice is often shaped by perspectives originating in the first wave. Therefore, the participants chosen were early career project managers not yet inculcated into traditional practices. In addition, participants were selected whose experience of using social media pre-dates their experience of formally managing projects.

Non-directive interviews were used to uncover the lived experiences of early career, social media savvy, project managers, thereby shedding new light on the prospects for the use of social media in project management.

Chapter 4 presents the findings from each of three stages. Data was also collected for validation and the findings from six interviews with professional, practicing project managers are included in the chapter.

In chapter 5, there is discussion of the findings. Theory from the disciplines of organisational learning and knowledge management is used to explain how some weaknesses in traditional forms of project management are addressed by use of social media.

Finally, in chapter 6, conclusions are drawn and limitations of the work are discussed. The contribution to knowledge made by this work is to increase understanding of how social media interacts with the practice of project management, enabling the development of new guidelines for practice. Empirical evidence has been provided that adds depth and breadth to previous work in terms of the types of technology, the factors influencing use, the activities where social media can effectively be deployed, and the impacts, consequences and concerns of using social media in project settings. The activities and impacts have been mapped against the different types of technology to provide a foundation for creating good practice guidelines that are expected to improve the likelihood of project success. Suggestions for further research to extend understanding of project communication are provided at the end of the report.

## **2 Literature Review**

### **2.1 Introduction and structure of the review**

The purpose of this review is to build up a conceptual framework to provide a structure for bringing together the two aspects of the work. The outline structure shown in Fig. 1.3 is used consistently throughout the chapter to shape the discussion and detail is added as the review progresses. Individual aspects of the structure are discussed in turn. Where one aspect is the focus of a discussion, a 'thumbnail' approach is adopted whereby only the detail relevant to the discussion is shown and, for consistency, the other aspects are included in outline only.

This review is broadly in two parts. The first part is concerned with the domain of project management (sections 2.2 - 2.4) and begins with a brief history of project management. Three waves of development are discussed and the notion of projects as social processes is introduced in section 2.2. The focus then moves to communication in projects. Levels of managing projects and how projects connect to their environment are discussed in section 2.3. Theoretical and practical reconsiderations of project management are used to propose a conceptualisation of project communication as taking place in a series of three zones. In section 2.4, selected literature from the field of organisational learning is used to extend understanding of the requirements for project communication. This part of the review concludes by identifying key activities in each of three zones of project communication.

The second part of the review is concerned with social media. Section 2.5 begins by introducing the notions of hyperconnectivity and digital natives. A taxonomy of social media technologies is then developed using practitioner commentary on use of social media by project managers, combined with research on use of collaborative technologies in project work.

Sections 2.6, 2.7 and 2.8 develop in detail the conceptual framework for using social media to manage projects. The context is developed in section 2.6 using theory from the mature field of technology adoption and use, and a range of influencing factors are identified. In sections 2.7 and 2.8, empirical research is combined with professional commentary to identify the behaviours and perceptions involved in using social media on projects. The project management activities involving social media are explored in section 2.7. Perceptions of the impacts, benefits and concerns are discussed in section 2.8 and used to complete the conceptual framework. Finally, a summary is provided in section 2.9.

## 2.2 A brief history of project management

Projects have existed for millennia but their management has only been a subject of intellectual enquiry in relatively recent times. It has been suggested that there is a lack of historical understanding of the emergence of project management and that most project management research and teaching is a-historical (Lenfle and Söderlund 2014).

Behaviours that can today be regarded as aspects of project management have been identified from ancient times. For example, Morris (2013, p.14) noted use of the term “supervisor” in ancient Egypt; “discussion of organisation and leadership by, *inter alia*, Socrates, Aristotle and Xenophon”; and the organisation of projects into work packages in ancient Greece. Until the late 18<sup>th</sup> century, according to Morris (2013), emphasis was placed on the organisation of projects and the integration of design and construction. Around the late 18<sup>th</sup> century, the rise of the professional engineer broke the integration that was “at the heart of effective project management” (Morris 2013, p.16) and, amongst other consequences, gave rise to the need for formally recognised project roles. By the late 19<sup>th</sup> century, so-called scientific management dominated intellectual developments in the field of management and “the emergence of project management in the areas of project control and coordination” was observed (Morris 2013, p.19).

The Manhattan Project in the 1940s has been suggested as the origin of a modern approach to project management but this is contested. Morris (2013, p.23) has argued that, although a dedicated project-orientated organisation was deployed, “the concepts of the discipline as it became articulated post the early to mid-1950s” were not used. However, the Manhattan Project can be viewed as an early example of project management activity as “divorced from ... the institutional levels of enterprise management” (Morris et al 2011, p.2). From the 1950s onwards, a first wave of project management (Morris et al 2011) can be identified and shaped much of what is recognised as project management today. This first wave represents what is referred to in the present work as a traditional or conventional approach to project management.

### Traditional project management

A traditional approach to managing projects is based on what has been called an engineering view of projects, where the focus is on construction of a building or the achievement of a goal, and management is “execution orientated” (Morris 2013, p.111).

Development of the practice of project management in the 1950s and 60s was largely driven by the defence, aeronautics, oil and chemical industries, and was based almost

exclusively on quantitative techniques (e.g. Cicmil and Hodgson 2006). The tools and techniques that were developed at this time – such as critical path analysis, work breakdown, configuration controls and others – reflected a predominantly a prescriptive approach to managing projects that:

“can be summarized as the application of knowledge, skills, tools, and techniques to project activities to meet project requirements” (ibid., p.111).

A project management profession started to develop as methods were formulated and codified, and the first project management association was formed in 1965, now called the International Project Management Association (IPMA). Today the profession is represented by over 55 organisations including the Project Management Institute (PMI) in the US as well as other, smaller, national organisations such as the Association for Project Management (APM) in the UK. Many of the professional societies publish Bodies of Knowledge (BoKs) that set out what they consider the core knowledge of managing projects, and the PMI’s body of knowledge is often considered a global standard (Turner 2014).

A concept underlying the PMI approach is the plan-do-check-act cycle that was originally developed for quality management and used in process management. A set of 47 discrete processes comprise the PMI’s project management standard. The 47 processes are categorised into five process groups – initiating, planning, executing, monitoring and controlling, and closing (PMI 2013). Although the PMI has been, and continues to be, highly influential amongst practitioners, its approach has been criticized for not representing all the knowledge necessary for managing projects (Morris 2013). Their focus on the “unique” aspects of project management, rather than taking a more holistic view, has been considered “disembodied and inadequate” (Morris 2013, p54). In contrast, the APM’s (2012) body of knowledge adopts a broader approach that has been linked to a broader conceptualization of the field and has been internationally recognized (having largely been adopted by the International Project Management Association).

During the 1980s project management spread to industries beyond those where the early tools and techniques were developed, most notably into the field of information systems and technology (IS/IT). Growth of computer technology enabled sophisticated systems for planning, control and risk analysis to be developed. Project scheduling problems, planning and review techniques preoccupied investigators and practitioners (Ika 2009), based on a deep conviction that the development of better scheduling would lead to better project management and, thus, project success (Belassi & Tukel

1996). Increasingly sophisticated models for planning and monitoring were developed even though research found only the most basic models were used by practitioners and not always as intended (Packendorff 1995). Against this backdrop, the challenges faced by practitioners were increasing and project failure became a common experience (Williams 2005). Projects were often completed late or over budget, results were not considered satisfactory, and stakeholders were disappointed (e.g. Morris and Hough 1987). By the mid-1980s, the track record of projects was fundamentally poor, particularly the larger and more difficult ones (Morris and Hough 1987). Spurred on by perceptions of failure, new initiatives originated with both researchers and practitioners that resulted in what has been considered a second wave of project management.

### Managing projects

The intellectual underpinning of project management is, it has been argued, fairly thin, due to an emphasis on tools and techniques used on projects undertaken in an environment “that was heavily shielded from external disruption” (Morris et al 2011, p.2). In the second wave, initiatives expanded theory

“to encompass traces of organizational research and theories largely concerned with project organisation structures (i.e. the matrix form), project leadership, the role of human resource management in facilitating project work and advice on project team building” (Cicmil and Hodgson 2006, p.112-113).

This second wave of project management has been characterized by, amongst others, emphasis on governance and managing projects as whole entities.

Practitioner initiatives included the development of methodologies for project management as an attempt to minimize project disasters. In the UK, PRINCE (PProjects IN a Controlled Environment) was developed for managing projects in the field of information systems and technology (IS/IT). One feature of PRINCE was the introduction of a Project Board to address project governance. The idea of a Project Board built on the use of a steering group to represent the perspectives of different interest groups (technical, users and the business) in managing IS/IT projects. PRINCE was developed further such that PRINCE 2 was released in 1996 for wider application to projects of all types and became a de facto standard for managing projects. Another practitioner initiative was to situate projects within program(me)s and portfolios, as seen in the APM’s (2012, p. xvii) “P3 Management” approach. Program(me) management is considered to be “more ‘business-driven’ than project management – an emphasis different from the product development base of a decade earlier” (Morris 2011, p29) and began to receive increased attention. Formal methods and approaches of the second wave tend to emphasize governance and a belief that greater scrutiny by

the right people will increase the likelihood of project success. Despite these developments and the tireless efforts of practitioners, projects' results continued to disappoint stakeholders (Wateridge 1995).

Research attention to project success has also shaped notions of managing projects. De Wit (1988) distinguished between *project management success*, as denoted by performance against the traditional measures of cost, time and quality, from *project success* as measured against overall project objectives. Atkinson (1999) considered stakeholder perspectives as a dimension of success. Cooke-Davies (2002) built on De Wit's (1988) work and added a third, institutional level. Such research widened the concept of project success, and how success or failure might be measured, but overall perceptions of project failure continued, as Eveleens and Verhoef (2010, p.30) commented:

“... the many efforts and best practices for better project management have no effect on the project's success.”

By the end of the century, across a range of disciplines and in many quarters (although not all), the existence of a crisis of some kind in the field of project management was recognized, although the diagnoses in the field were unsurprisingly varied (Cicmil and Hodgson 2006). Specifically focused on the narrow conceptualisation of projects and project management, one response to perceptions of a crisis was the UK Government funded Rethinking Project Management Network (Winter et al 2006a).

Svejvig and Andersen (2015) suggest that since 2006 there has been a stream of literature around re-thinking project management that has addressed the field from a range of perspectives (e.g. Blomquist et al 2010, Cicmil and Hodgson 2006, Winter et al 2006b). Re-thinking project management can be viewed as one crest of the third wave of project management.

## Re-thinking project management

Two main drivers have been identified within what has been described as a revolution in the field of project management:

1. “practical reconsideration of prescriptions rooted in the rationality of decision theory, which seem to generate technical and commercial failures, internal and external conflicts, and inadequate responses to unexpected events”, and
2. “theoretical reconsideration of projects as temporary organizations embedded in different social contexts”.

Florice et al (2014, p.1091)

Practitioners have responded to the first driver by proposing new approaches, such as agile methods (e.g. Conforto et al 2014). Agile approaches from industry were adopted for software development projects and emphasise organisation, change and communication between team members, as explained by Augustine 2005, p. 21):

“Agile methodologies including eXtreme Programming ... provide techniques for delivering customer value on software development projects while creating agility through rapid iterative and incremental delivery, flexibility, and a focus on working code”.

The principles of agile project management address some of the criticisms levelled at traditional approaches, and are expressed by Augustine (2005) as follows.

- *“Foster alignment and cooperation.* People are considered the primary agents driving value, change, learning, and adaptation. Shared vision keeps people aligned and acting towards common goals. When people are in alignment, they eschew competition and cooperate to work with each other for mutual gain.
- *Encourage emergence and self-organisation.* Processes and practices are kept minimally simple. People self-organize to deliver maximal business value. Complex patterns, including self-organized behavior and optimal structure, *emerge* from close interactions between many people following simple rules.
- *Institute learning and adaptation.* Feedback is used for continuous learning, adaptation, and improvement. Projects operate on their *chaordic edge* – the edge between chaos and order – where there is “just enough” control, structure, optimization, and exploration. Too little structure and a project swings towards chaos, too much and it gets mired down. Too little exploration and the project loses touch with changing exploration, too much and it veers off course.”



(Augustine 2005, p.25 original emphases and spellings).

Some evidence of support in practice has been reported as agile approaches are found to be effective and successful (Udo and Koppensteiner 2003). The success of such approaches has been most notable on software development projects but Conforto et al (2014) found companies have struggled to use agile project management in the face of different project challenges.

Researcher efforts, on the other hand, have been directed

“towards understanding the specific nature of social relations, structures and processes that occur in projects“ (Florice et al 2014, p.1091).

Research using systemic models has begun to capture the socially constructed nature of reality in a project. Such research has suggested that, particularly for projects that are complex and uncertain, conventional methods may be inappropriate (Williams 2005).

The largely objectivist stance of conventional project management has been challenged. Project management literature, it has been argued,

“tends to rely upon the language of design, regularity and control to propose models and prescriptions as a route to increasing the ability of humans to control complex worlds” (Cicmil and Hodgson 2006, p.111).

One challenge by researchers has been to notions of projects as transformation of inputs to outputs (e.g. Williams 2005). Projects have been re-conceptualised as engines of change. For example, there has been a

“growing conceptual shift away from the traditional engineering view of projects, towards a more business-orientated view, in which the primary concern is no longer the capital asset, system or facility etc. but increasingly the challenge of implementing business strategy, improving organizational effectiveness, and managing the realisation of stakeholder benefits” (Winter et al 2006b, p.699).

Projects as engines of change are problematic for traditional project management approaches. Williams (2005) has highlighted three emphases in project management practice as particularly problematic. First is a heavy emphasis on planning and a belief that action should always be preceded by planning based on analysis. Planning is seen as removed from the real situation and is therefore artificial (Machin and Wilson 1979, Williams 2005). A criticism is that the information necessary to plan effectively is

unlikely to be available at the outset, particularly in complex or changing situations. Conventional approaches to project management are largely based on assumptions about the completeness and detail of information available at an early stage. Increasingly it has been recognized that, “contrary to this emphasis, the project emerges rather than being entirely preplanned” (Williams 2005, p. 504).

Second is an emphasis on objective reality. Projects are conceptualized in objective terms and there is emphasis on facts that are “real” and can be observed independently from the observer. Project management is presented as

“a set of normative procedures which appear to be self-evidently correct: following these procedures, it is implied, will produce effectively managed projects; and project failure is indicative of inadequate attention to the proper project management procedures” (Williams 2005, p.498).

There is an assumption that a project is susceptible to a conventional control model, as many authors have noted (e.g. Maylor 2010, Cicmil and Hodgson 2006). Relatively simple patterns of cause, effect and feedback are assumed to operate and these largely ignore the complexity of human systems (Williams 2005, Winter et al 2006a).

Thirdly, there is an emphasis on managing scope. It is assumed that the scope of a project can be managed by decomposing the total work effort into smaller elements of work (Williams 2005, Remington and Crawford 2004, Koskela and Howell 2002a). Reductionist thinking (Remington and Crawford 2004) and an assumption that tasks are independent except for sequential dependencies (Koskela and Howell 2002b) are suggested. One consequence of this emphasis is that a project becomes decoupled from its environment (Williams 2005).

One alternative to a purely deterministic model of project management is conceptualisation of projects as social processes. Conceptualization of projects as social processes and the role of social processes in project management have been identified as perspectives worth exploring (e.g. Sauer and Reich 2009, Winter et al 2006a, Bresnen et al 2005).

## **Projects as social processes**

A social perspective uses

“concepts and images which focus on social interaction among people, illuminating: the flux of events and human action, and the framing of projects (and the profession) within an array of social agenda, practices, stakeholder relations, politics and power” (Winter et al 2006a, p.642).

However, on social processes, “not much literature is specifically related to project management” (Hanisch and Wald 2011, p.11). According to Hanisch and Wald (2011), the transdisciplinary nature of project management has been a major challenge for academic research and a range of factors has received insufficient attention. The two relevant sources identified by Hanisch and Wald (2011) are Bresnen et al (2005) and Balkundi and Harrison (2006). Bresnen et al (2005) discussed managing projects as complex social settings and argue that new and alternative insights can be brought to bear on long-standing organisational and management problems and issues by unpacking many of the underlying assumptions and meanings. Further, there is some research that has linked team relationships and performance. Balkundi and Harrison (2006) combined network and leadership perspectives and found teams with both densely configured interpersonal ties and leaders who were central in the teams’ intragroup networks tended to perform better; Brueller and Carmeli (2011) linked the quality of relationships in a team with learning and performance.

A framework to delineate and relate social concepts, including ideas of social networks and social capital, to a project environment was developed by Brookes et al (2006). Their empirical research provides evidence that conducive relationships are strongly and significantly correlated with trust and respect (Brookes et al 2006). Correlation has also been demonstrated between conductivity and “the extent to which individuals in the relationship had a common background” (ibid., p.481).

Social processes are recognised as important for effective project knowledge management (e.g. Gasik 2011, Brookes et al 2006, Inkpen and Tsang 2005, Bresnen et al 2003). Positive relationships among an organisation’s members are “a basic pre-requisite for knowledge transfer” (Gasik 2011, p.36) and a community-based approach to managing knowledge has been suggested (Gasik 2011).

## **Knowledge management in projects**

The application of knowledge management concepts as a way to improve project success is suggested by Reich and Wee (2006). For their analysis of knowledge

processes in project management, Reich and Wee (2006) used Zack's (1999) differentiation of knowledge from data and information as follows:

- “Data represent observations or facts out of context, and therefore not directly meaningful
- Information results from placing data within some meaningful context
- Knowledge is that which we come to believe and value ... through experience, communication or inference.” (Zack, 1999, p.46)

Zack (1999) also distinguished between tacit and explicit knowledge:

- “Tacit knowledge is subconsciously understood and applied, difficult to articulate, developed from direct experience and action, and usually shared through highly interactive conversation, storytelling and shared experience.”
- “Explicit knowledge, in contrast, can be more precisely and formally articulated. Therefore, it can more easily be codified, documented, transferred, or shared.” (ibid.)

Reich and Wee (2006) looked for knowledge processes in project management. They interrogated the PMI's “globally influential” guide to project management body of knowledge and conclude there is

“... a strong bias toward explicit and declarative knowledge, and ... less attention to tacit and causal knowledge.” (Reich and Wee 2006, p.11)

Project management processes were classified by Reich and Wee (2006) using the SECI model of knowledge creation (Nonaka and Konno 1998). The SECI model shows how knowledge creation involves conversions between tacit and explicit forms of knowledge in four processes: socialization, externalization, combination, internalization (Nonaka and Konno 1998, original spellings), as illustrated in Fig. 2.1.

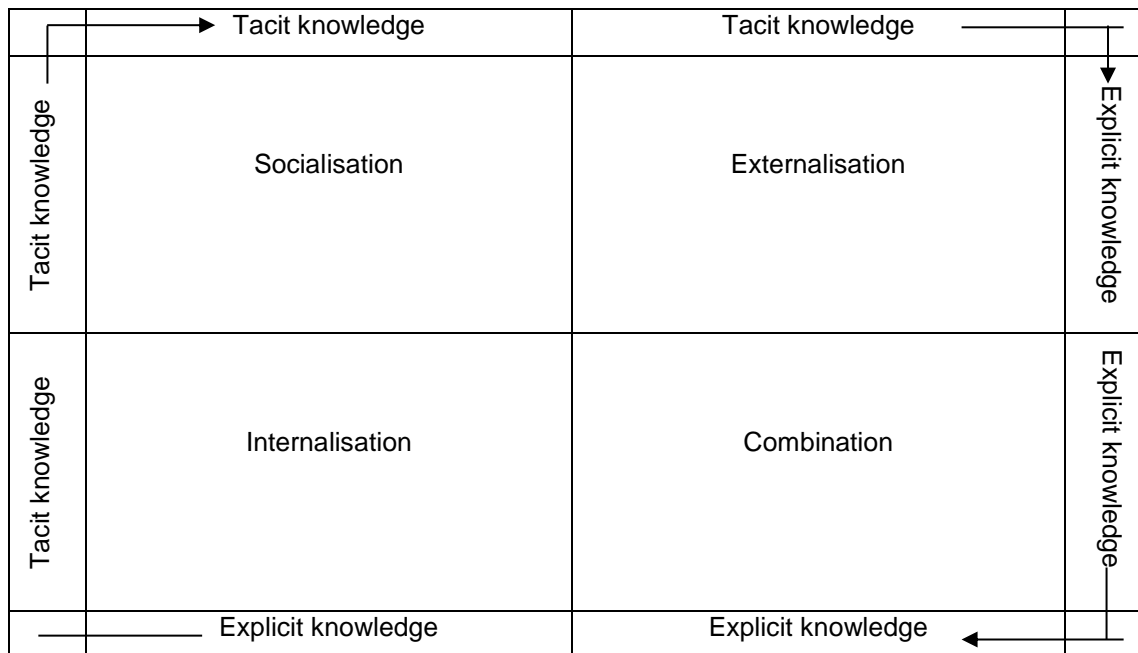


Fig 2.1. SECI Model (Nonaka and Konno 1998)

The SECI processes are described by Nonaka and Konno 1998, p40-45, original spellings) as follows:

- “Socialization involves the sharing of tacit knowledge between individuals.... Knowledge is exchanged through joint activities – such as being together ...”
- “Externalization requires the expression of tacit knowledge and its translation into comprehensible forms that can be understood by others.” For example in words, text or images.
- “Combination involves the conversion of explicit knowledge into more complex sets of explicit knowledge.”
- “... the internalization of newly created knowledge is the conversion of explicit knowledge into the organization’s tacit knowledge. This requires the individual to identify the knowledge relevant for one’s self within the organizational knowledge.”

Reich and Wee (2006) analysed processes identified in the PMI (2004) body of knowledge and mapped the project management processes onto the SECI Model. The results of their analysis are shown in Table 2.1. Reich and Wee (2006) found no project management processes for socialisation and internalisation.

Table 2.1 Occurrences of knowledge transformation processes in the PMBOK Guide ® (Reich and Wee 2006)

<b>Socialization</b> 0 out of 44 processes	<b>Externalization</b> 20 out of 44 processes
<b>Internalization</b> 0 out of 44 processes	<b>Combination</b> 38 out of 44 processes

Socialisation and internalisation processes are considered essential for developing and managing new knowledge within an organisation. In the context of project management, the organisation is the project. New knowledge is created during a project. Socialization is required to share the new tacit knowledge amongst project stakeholders. An absence of socialization processes means tacit knowledge will remain isolated within individuals and is not incorporated into the collective cognitive map that represents the organisation’s tacit knowledge. Internalization is concerned with transferring new explicit knowledge into the organisation’s tacit knowledge. Without processes for internalization, explicit organisational knowledge does not become part of individuals’ tacit knowledge, and consequently is not incorporated into the collective cognitive map of project knowledge.

The importance of socialisation and internalisation to effective knowledge management may provide one explanation for the focus on human interaction found in agile approaches to project management. Further, empirical research on software projects has shown that the availability of both tacit and explicit knowledge is required for effective decision-making and sustainable development (Sandhawalia and Dalcher 2015). Communication amongst individuals is implicit in all four knowledge processes of SECI and this review now turns to examine communication in project management.

## 2.3 Communication in project management

The prefix *com* means “together”; therefore communication can be seen as “an effort to bring individuals together” and an “attempt to create a common understanding and a common informational basis” (Pritchard 2014, p.22). Communication is widely recognized as an important aspect of project management, for example:

“communication is the cornerstone of project management ...” (Pritchard 2014, p.22)

“Effective flow of data and communication at every stage of a construction project is essential for achieving required coordination and collaboration between the project participants, leading to successful management ...” (Ahuja et al 2009, p.323)

The PMI’s influential body of knowledge recognises communications management as a key knowledge area and three processes are identified – Plan Communications Management, Manage Communications, and Control Communications (PMI 2013).

Snyder (2013) suggests PMI’s model of communication is a very basic:

“... sender-receiver model where the sender is responsible for making the information clear and complete and the receiver is responsible for ensuring the information is received in its entirety, understood and must acknowledge receipt.” (Snyder 2013, p.120)

The process view of PMI (2013) suggests an objective model of communication that reflects a traditional, action-orientated view of project management, with a focus on transforming inputs to deliver outputs.

APM (2012) also recognize the importance of communication in their P3 approach. Within their body of knowledge, communication is addressed as the first interpersonal skill and the importance is explained as follows:

“Communication is fundamental to the P3 environment. Poor communication can lead to misunderstood requirements, unclear goals, alienation of stakeholders, ineffective plans and many other factors that will cause a project, programme or portfolio to fail. None of the tools and techniques described in this body of knowledge will work without effective communication.” (APM 2012, p.52)

Communication is defined by APM (2012, p.52) as “the means by which information or instructions are exchanged”. This definition is somewhat limited and suggests an

emphasis on objective reality. However, there is also some recognition of the impact on human behaviour of other realities, for example:

“Communication takes many forms. It can be verbal, non-verbal, active, passive, formal, informal, conscious or subconscious. How communication is executed affects understanding and feelings, both of which impact the meaning received...

Language should be neutral, clear, objective and avoid unnecessary emotive terms. However, there may be occasions where appropriate emotion and associated delivery mechanisms such as body language can generate a specific, desired effect. There are often barriers to effective communication. These can be physical, as in the team location or the working environment. They can be cultural, arising perhaps from lack of a common language or understanding across disciplines. Barriers can lead to negative perceptions and related emotions such as envy, fear, mistrust and suspicion.” (ibid.)

Both PMI (2013) and APM (2012) emphasises project planning. Initially there is a focus on gathering requirements, preparing a business case and obtaining project approval. Once a project is underway, APM (2012, P.53) suggest “progress must be communicated and stakeholder support maintained”. Thus, in traditional approaches to project management, prescribed communication is concerned with planning, controlling and integrating project work. The perception of a project boundary is important for conceptualising communication in conventional approaches to project management, and is shown in relation to the conceptual framework that underlies this work, as illustrated in Fig. 2.2.

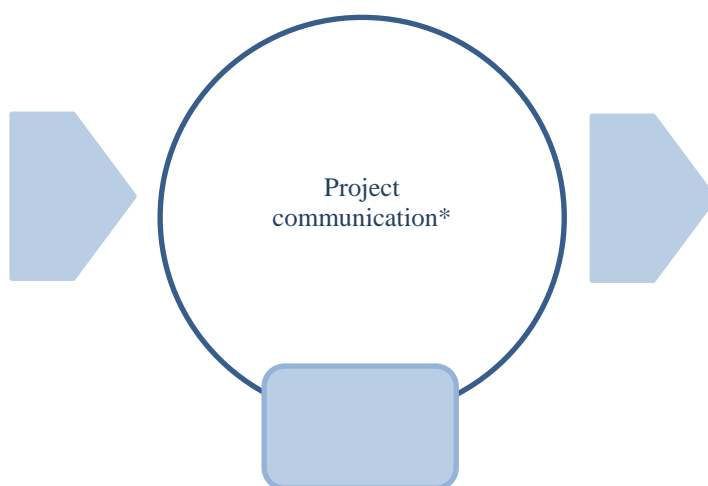


Fig 2.2 Communication and the project boundary

\* Detail of activities are not shown here and will be developed later in this chapter



## **The project boundary and communication**

Empirical research on communications in project management has shown a lack of good communications beyond the boundary of the project team (Partington 1997).

Further, Müller (2003, p.346) noted

“emphasis is put on communication with the members of the project team, formed for implementation of the project, rather than customers and other organizations external to this team”.

The importance of effective communication and consequences of communications failure are recognized to some extent by PMI (2013) and APM (2012) but approaches to communication do not reflect the complexity of human interaction. Suggested communications practices tend to reflect a deterministic approach and all three of the emphases highlighted as problematic by Williams (2005) can be identified in such approaches.

First, planning is highlighted by Williams (2005). Plan Communications Management is the first of the PMI's (2013) communications' processes and they suggest:

“On most projects, communication planning is performed very early, such as during project management plan development.” (PMI 2013, p. 290).

The communications plan can include communications item, purpose, frequency, start/end dates, format/medium and responsibility. However, fully identifying these elements at the start of a project can be problematic. Similarly, APM (2012) prescribe a project communications plan. There is an underlying assumption that communications activities are preceded by planning based on analysis. Suggestions for the content of communication, such as work breakdown structures, critical path analysis etc., indicate that project activities are considered to be discrete, bounded and well understood from the outset.

Second, objective reality is highlighted by Williams (2005). This can be seen in the PMI's (2013, p. 294) suggestion that

“the sender is responsible for the transmission of the message, ensuring the information being communicated is clear and complete, and confirming the information is correctly understood. The receiver is responsible for ensuring that the information is received in its entirety, understood correctly, and acknowledged or responded to appropriately.”

From this view, interpretations, perceptions and the social context are considered largely unimportant (Williams 2005). PMI's (2013) Performance Reporting process, for example, emphasizes measurements, forecasts and causal feedback also illustrates an emphasis on objectivity. The communications management plan is input to the Manage Communication process, and hence there is an implicit assumption that the stakeholders and their needs have all been identified at the planning stage.

Suggestions in APM (2012) for the content of communications also indicate a focus on objective reality. Barriers to effective communication are discussed and the existence of subjective reality is acknowledged:

“Barriers can lead to negative perceptions and related emotions such as envy, fear, mistrust and suspicion.” (APM 2012, p.52)

However, traditional approaches to project communications generally lack attention to complex human interaction.

Third, Williams (2005) suggests projects can become decoupled from their environment as a result of managing scope. Communications planning relies on defining a project boundary as a means of controlling the scope of a project. The boundary then becomes a barrier between the project and the external environment. Empirical research on communications in project management has shown a lack of good communications beyond the boundary of the project team (Partington 1997). The influence of enterprise environmental factors on communications is recognized by PMI (2013) and APM (2012), but little attention is given to how these might change over the life of the project, how new factors influencing a project might be identified, or how a project might respond to new influences as work progresses. Detecting and managing new information or changes in stakeholders are not addressed. Overall, the communications processes suggested in professional literature tend to inhibit change and disconnect a project from its environment. In a conventional approach, communication within a project boundary, and to some extent across the boundary, the emphasis of communication is planning, controlling and integrating work, as shown in relation to the conceptual framework for this work in Fig. 2.3.

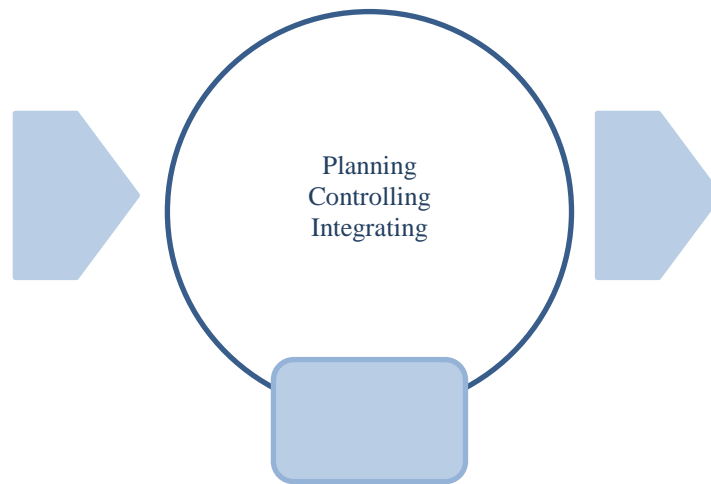


Fig 2.3 Communication in conventional project management

The issues surrounding the concept of a project boundary have been highlighted above. One response to such issues has been to manage projects as whole entities. The notion of managing whole projects prompted suggestions of different levels of management. Three levels of management are recognised by leading academics and professionals alike (e.g. Morris 2013, APM 2012). The levels identified by different authors are not identical but there are similarities, and these will be discussed next. Although the levels tend to emphasise projects as delivery, and reaffirm an objectivist stance, a discussion of literature on levels of management is useful in developing ideas about communication.

### Levels of management

Morris (2013) defines three levels of management, as does the APM (2012), while Turner (2014) suggests a four-step management cycle and there are five process groups in PMI (2013). In this section, the different approaches are compared and ideas about project communication are developed.

The first level defined by Morris (2013) is concerned with performance, called the technical core. Management is execution-orientated and efficiency is the key concern. Turner (2014) suggests a management cycle with four inherent steps - planning, organizing, implementing and controlling – with a focus on delivery. The APM's (2012) first level has a focus on achieving planned project objectives, closely corresponding with Morris' (2013) technical core and Turner's (2014) four-step management cycle. Turner (2014) suggests there are three levels of a project - project work, facility/asset output, and benefit/purpose outcome. According to the APM (2012, p.12), a project's objectives can be defined in terms of outputs, outcomes or benefits and therefore this

level incorporates all three of Turner's (2014) project levels and all four steps of his management cycle (planning, organizing, implementing and controlling).

The second level defined by Morris (2013) is a strategic wrap, where management is concerned with value and effectiveness. Morris' (2013, p. 118) strategic wrap has two key features:

“(1) expanding the domain to include their front-end development and definition and (2) protecting the technical core from environmental turbulence”.

This second level “recognises the relationship between the project and various stakeholders' strategies” (ibid. p118). Turner (2014), on the other hand, focuses on the project and distinguishes between the project work, the facility/asset output, and benefit/purpose outcome. Turner (2014) excludes from his cycle the definition of a project that was included in Morris' (2013) strategic wrap. These views extend the traditional performance view of project management.

Four of the PMI's (2013) five process groups correspond to Turner's (2014) four step cycle at the first level, while the fifth, the initiating process group, is incorporated within Morris' (2013) second level. However, some aspects of project initiation are included within the APM's (2012) first level and are listed as the first four core components of project management:

- “defining the reason why a project is necessary;
- capturing project requirements, specifying quality of the deliverables, estimating resources and timescales;
- preparing a business case to justify the investment;
- securing corporate agreement and funding.” (APM 2012, p.12)

The idea of a second level of management can be seen in the “Programme” level of the APM's (2012) P3 approach and the Project Board in PRINCE. Both a Project and a Programme Board can be seen as forums for communication that can be distinguished from the forms of project and team communication emphasized in conventional approaches. However, PRINCE and its successors are still essentially product-orientated approaches to project management that are based on the assumption that “all concerned will know what is to be produced and can recognise whether it has (or has not) been produced” (CCTA 1989, p.2).

Programme management is defined as:

“the coordinated management of projects and change management activities to achieve beneficial change” (APM 2012, p.241).

This conception reconfirms the view of project management as execution management (Morris 2011) but, for the purpose of understanding communication in a project environment, it is useful to consider the construct of program management further.

Four core components of program management are identified by the APM (2012): project coordination, (business) transformation, benefits management, stakeholder management and communications. The focus on achieving beneficial change has some resonance with Turner’s (2014) definition of a project, and with Morris’ (2013) concern for value and effectiveness. The idea of multiple projects can be seen as one set of relationships in Morris’ (2013) institutional wrap. However, the APM’s (2012) definition of programme management explicitly recognizes a need for change management activities, whereas Morris (2013) refers to protecting the technical core from turbulence and this can be interpreted as resisting or inhibiting change. The APM’s (2012) attention to the coordination of multiple projects sets apart its concept of program management apart from other perspectives of second level project management.

Morris (2013) defines a third level of managing projects as the institutional level. This level is concerned with “the long-term project management health of the organisation” (Morris 2013, p119). Morris (2013, p.118) includes “the enterprise’s own organisational context ... or the wider environmental context ... or both” in this level and there is emphasis is on influencing

“the context within which the project, and other projects and programs, occurs in order to enhance their effectiveness” (ibid.).

Portfolio management is seen by APM (2012) as the third level of managing projects and is defined as

“the selection, prioritisation and control of an organisation’s projects and programmes in line with its strategic objectives and capacity to deliver” (APM 2012, p240).

Core components are not identified, rather it is suggested that portfolio management encompasses techniques such as strategic planning, change management, project and programme management. The attention given by Morris (2013) to the context within which projects and programs are managed, and the maturity of the process for managing project, is less clear in the APM’s (2012) third level, and it is difficult to distinguish clearly between portfolio and programme management. Indeed, there

seem to be the greatest differences between authors in the way different levels of management are discussed at this third level.

Levels of managing are helpful for conceptualising project management and illuminating some aspects of communication. However, the levels of management as they are defined in literature and in practice tend to reaffirm a view of project management as execution, from an objectivist stance. For this research, communication is conceptualised in 'zones'. A zone is defined here as

“an area, especially one that is different from the areas around it because it has different characteristics or is used for different purposes” (Cambridge Dictionary 2016).

## **Zones of communication**

The term zone has been chosen in preference to 'area' or 'domain' because the latter suggest organisation or control. For example, the term domain is used by Morris (2013) but is defined as "an area of interest or an area over which a person has control" (Cambridge Dictionary 2016), and therefore tends to reinforce notions of control. In contrast, zones of project communication indicate communication has different purposes and therefore different characteristics.

Conventional approaches to managing projects suggest communication with a purpose of project participation. Hence, an initial zone of communication is a 'zone of participation' where the purpose is conceptualised as participation in the project by team members and stakeholders.

## **Project participation**

Participation is defined as "the action of taking part in something" (Oxford Dictionaries 2016). In the context of the present work, "something" refers to a project; and "taking part" refers to working on a project and participating in the management process. Following a conventional view, the management process is considered to be inherently a process of planning and control (Cleland & King 1983). Planning and control are therefore the first purpose identified for communication in the zone of participation.

The zone of participation has some features in common with the first level of managing projects and, in particular with Morris' (2013) technical core. The focus of communication in this zone is on execution and delivery. However, following a re-thinking approach, a focus on delivery of outputs is extended to incorporate the notion that understandings of business value are developed within a project. Value and benefits have multiple meanings linked to different purposes and perspectives, individual and organisational (Winter et al 2006a), and so opportunities are required for sharing understandings and perspectives. Agile approaches focus on participation through human interaction and bring communication to the fore. In an agile approach, face-to-face communication amongst those directly participating in a project is facilitated by colocation of the project team. The project team typically includes customers and users, as well as technicians. Rich interactions occur in dedicated space for "impromptu meetings, design sessions, and other formal and informal group activities" (Augustine 2005, P. 21). Face to face interactions provide opportunities for communication that extends beyond objective reality, enabling perspectives and feelings to be shared, and for work to be coordinated and integrated. Feedback and

learning are also highlighted in agile approaches, hence two further purposes for communication in the zone of participation are identified.

There has been increasing recognition that that projects emerge under external influences (e.g. Williams 2005) and the notion of emergence is explicit in the principles of agile. Broader conceptualisations imply projects are:

“...not always pre-defined, but permeable, contestable and open to renegotiation throughout ...” (Winter et al 2006a, p.642).

The boundary of the zone of participation must therefore be permeable to enable a project to interact with the external environment. The zone of participation provides the first part of the conceptual framework, as shown in Fig. 2.4. Agile principles suggest that feedback is needed to promote learning and a project needs to be able to adapt in response to learning. A learning perspective will be addressed again later, but the impact of feedback and learning on the project boundary and change control is relevant to conceptualising the zone of participation.



Fig 2.4 Initial conceptualisation of the Zone of Participation

There is some recognition of a need for communication across a project boundary in order to integrate the deliverables with business as usual processes, for example PMI (2013 p.13) suggest:

“At each point, deliverables and knowledge are transferred between the project and operations for implementation of the delivered work.”

However, PMI (2013) give little attention to the means of achieving integration across the project boundary. APM (2012) make suggestions for outward communication from a project or program with the aim of connection to business as usual e.g.



“The aim is to ensure that all those affected by the programme have a common understanding of why it is necessary and beneficial...” (APM 2012, p.52)

In addition to integrating the project deliverables with business as usual processes, communication across the boundary is required to enable a project to become aware of, and respond to, changes in its environment. Agile approaches focus on an emergent order and integrating work from different perspectives. However, an agile approach as well as a conventional approach, tends to be dependent on the definition of scope and formation of the project team at an early stage. A boundary in terms of scope and team can inhibit a project from identifying and responding to change. Therefore, there is a need for on-going communication across the project boundary to ensure a project remains connected to its environment.

### **Connecting a project to its environment**

A project may be well connected to its environment at the beginning, if communication is highlighted during the definition and planning stages. Project definition is highlighted by APM (2012) at the first level of managing, while for Morris (2013) project definition is an important aspect of the second level of managing projects. Plans are typically developed early in a project and reflect the project knowledge at that time, including the stakeholders and scope of work to be done. As the project progresses and new knowledge emerges, original plans may become outdated. Accordingly, a focus on delivery and control based on an out dated plan, can inhibit flexibility.

An emphasis on planning is one response to perceptions of increasing complexity, both within a project and in the organisational context. The growing conceptual shift towards a business-orientated view of projects (Winter et al 2006b) has been one factor driving perceptions of increased complexity. Another factor has been perceptions of increasing external complexity in the context for projects: perceptions of complexity and change in the organisational environment, and of increasing influence by national, social, political, environmental and global factors that are external to the organisation itself.

Complexity and increased importance of communication are recognized by APM (2012) in the second level of managing:

“By their very nature, programmes contain greater uncertainty and complexity than projects. This makes carefully planned communication with the increased range and diversity of stakeholders even more vital....” (APM 2012, p.52)

The APM go on to identify a requirement for communication about changes to business as usual processes as more detailed information is developed:

“... the benefits of the programme and how the necessary changes will affect business-as-usual must be communicated. The levels of change instigated by a programme are often difficult to accept by some groups of stakeholders. Effective communication is central to mitigating the effect of opposition and marshalling support for the programme”. (APM 2012, P.54)

Communication as suggested by APM (2012) emphasises a one-way flow of information, outwards from the project or program. Communicating the project vision both with a project team and with stakeholders has received attention in project management literature. Agile approaches use the concept of a shared vision that “keeps people aligned and acting towards common goals” (Augustine 2005, p.25), while Müller and Turner (2010) suggest there is a need to sell a vision before commencing a project. APM (2012) suggest “Programme-level communication will initially focus around the vision” (APM 2012, p.54).

Outwards communication is also advocated for the purpose of connecting the project to business-as-usual processes. Both sharing the project vision and communication designed to connect a project to business-as-usual, can be planned at the beginning of a project. However outward communication, designed to mitigate opposition and marshal support, is not enough to enable change. Indeed, planned outward communication may even inhibit inward communication and thereby contribute to decoupling a project from its environment.

Change management principles are suggested by Cadle and Yeates (2008), who adopt a more proactive approach to change and achieving business benefits in the management of IS/IT projects. Communication to “win hearts and minds” is suggested by Cadle and Yeates (2008, p.343) who highlight that some consideration of subjective realities is required in their discussion of hot and cold vehicles of communication. They identify two key activities that require inward communication across the project boundary – “gather feedback” and “surface resistance” (Cadle and Yeates 2008, p.347). Rather than just communicating from the project outwards about organisational change, these two activities indicate a need for information to flow into the project from beyond the boundary.

The importance of starting with the context for a project, and of situational awareness are highlighted by Dalcher (2016c). He suggests

“situational awareness implies an appreciation of the wider context of a given situation including the environmental influences.” (ibid. p.4)

And context plays a principal part in “solving problems, managing and making decisions” (ibid., p.1), yet

“there is very little that is said about context within the [project management] guidance, the methodologies or even in the existing bodies of knowledge.” (ibid., p.3).

Taken together, outward and inward communications enable ideas to develop about adapting to change, both within the project and within external organisational processes. Hence, a second zone of communication is conceptualised and added to the conceptual framework, as shown in Fig. 2.5, where the purpose is connecting the project to the environment, involving five activities: sharing the project vision, connecting the project to business-as-usual processes, surfacing resistance, gathering feedback and adapting to change.

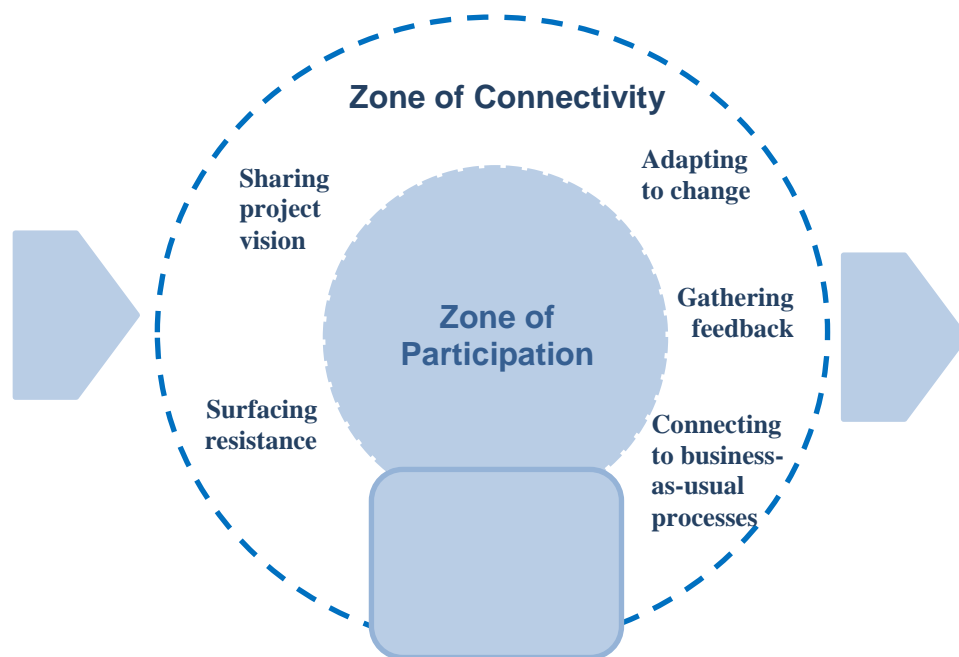


Fig 2.5 A second zone of project communication

The importance of learning within a project has been highlighted in the principles of agile approaches. A view of projects as engines of change, where a project emerges under external influence, also brings learning to the fore. This review now takes a learning perspective to expand understanding of the requirements for communication.

## 2.4 A learning perspective

A learning perspective has been one focus for project management research (e.g. Sense 2004, Reich 2007, Swan et al 2010). A perspective of projects as learning organisations provides insights that challenge the input-output view of projects, emphasising human interaction and suggests new requirements for project communications. Sense (2004, p.126) argued that:

“an increasing “chorus” is erupting across the project management, organizational learning and the knowledge management literatures on the importance of identifying and dealing with the sociological dimension of learning. What is also highlighted is a noticeable gap in the project management and organisational learning literatures specifically revolving around learning and its attributes within project management practice”.

### Organisational learning

Organisational learning was defined by Daft and Weick (1984, p.286) as:

“the process by which knowledge about action outcome relationships between the organisation and the environment is developed”.

Organisations must find ways to know the environment and this involves building up interpretations about the environment (Daft and Weick 1984). Daft and Weick’s (1984) work on organisations as interpretation systems is used here to develop an understanding of how projects connect to the environment.

An important assumption underpinning this research is that a project is a type of open social system. Boulding (1956) classified systems on a nine-level scale of complexity. The first level is frameworks; static structures such as the patterns of electrons around a nucleus. At the second level are clockworks; simple dynamic systems with pre-determined motions such as a steam engine. The following levels are thermostats, cells, plants and then animals. At level seven are human beings, level eight are social systems and level nine are “transcendental systems [of] ultimates and absolutes and the inescapable unknowables” (ibid. sic). Therefore a project is a system of level eight complexity and in terms of understanding such systems, Boulding (1956) said:

“at this level we must concern ourselves with the content and meaning of messages, the nature and dimension of value systems, the transcription of images into a historical record ... and the complex gamut of human emotion” (ibid., p.205).

And yet Daft and Weick (1984, p.284) suggest that

“most empirical research is at Boulding’s level 1 to 3, which assumes that organizations behave as static frameworks or mechanical systems.”

Much of the research on projects has tended to adopt an objectivist stance, and this can be seen to be inadequate in fully accounting for the complexity of human interaction.

Interpretation was highlighted by Müller (2003) in his work on the communication practices of IT project managers. However, the process of interpretation in organisations is “neither simple nor well understood” (Daft and Weick 1984, p.286).

Müller (2003) drew on organisational communications research which:

“showed that communication patterns between organizations are based on an organization’s “sensible” representation of their external environment i.e. a perception of the environment and not the environment itself”. (Müller 2003, p.346)

Daft and Weick (1984) represented the overall learning process of an organisation in three stages: scanning, interpretation and learning, as shown in Fig. 2.6. For this work, the three-stage model of organisational learning has been applied to understand the communication required to connect a project to the external environment.



Fig 2.6 Relationships among organisations’ scanning, interpretation and learning (Daft and Weick 1984)

### Projects as systems of interpretation

Learning, one stage of organisational learning, has been defined as a process of putting cognitive theories into action (Argyris and Schön 1978) and is “distinguished from interpretation by the concept of action” (Daft and Weick 1984, p.286). This stage can be correlated with the traditional view of a project as an action process. Learning has already been highlighted as a perspective that has received attention in agile approaches and in re-thinking project management. Here, learning and action are considered to be activities that take place within the zone of participation.

Interpretation occurs before learning and action, and is considered to be the second stage in organisational learning. In this second stage:

“data are given meaning. ... Perceptions are shared and cognitive maps are constructed. An information coalition of sorts is formed. The organization experiences interpretation when a new construct is introduced into the collective cognitive map of the organization. Organizational *interpretation* is formally defined as the process of translating events and developing shared understanding and conceptual schemes ...”

(Daft and Weick 1984, p.286, original spelling and emphasis.)

Interpretation provides meaning and a basis for action, and is therefore crucial in the process of managing a project. Interpretation can be seen as an important part of the process by which a project develops knowledge of the environment. During a project, new constructs are developed and introduced to the collective cognitive map, both as an integral part of project execution and in response to change. Müller (2003) highlighted the role of internal interpretations within a project:

“externally triggered activities in living systems are not directly caused by the outside world, but triggered by the system’s internal representation of the outside world” (Müller 2003, p. 346).

Before interpretation can take place, a learning organisation needs to acquire new information from its external environment. The first stage identified in organisational learning is scanning, defined as:

“the process of monitoring the environment and providing environmental data to managers. Scanning is concerned with data collection.”

(Daft and Weick 1984, p.286)

Scanning as a process of collecting data from the environment has not been identified in project management literature.

There are diverse ways organisations obtain knowledge about the environment. Daft and Weick (1984) suggest that one dimension in which there is variety is the extent that an organisation actively intrudes into the environment to search for data.

Organisations that actively search for data, for example by subscribing to monitoring services, may:

“... perform trials in order to learn what an error is, and discover what is feasible by testing presumed constraints. ... they will develop interpretations quite different from organisations that behave in a passive way.” (Daft and Weick 1984 p.288).

Passive organisations, on the other hand:

“accept whatever information the environment given them ... do not engage in trial and error ....they do not actively search ... they interpret the environment within accepted limits.” (ibid).

A perspective of projects as engines of change suggests that if a project is passive in terms of collecting external data then change may be constrained. Therefore, there is a requirement for communication that actively intrudes into the environment to collect data by scanning is required.

A perspective of projects as delivering value highlights a need for data to be collected from the environment as new knowledge is uncovered. A project may have difficulty delivering value within the limits defined at the outset. As a temporary organisation, a project may not be well connected to the data collection processes within the surrounding organisations and typically relies on stakeholders identified at the outset to communicate new knowledge or changes in influential factors, as and when such information becomes available. Accordingly, a project may not have processes for monitoring the environment and providing external data to decision-makers, and yet a project needs to develop an awareness of new influences or changes in factors that could affect the project or its outcomes.

### **Three zones of project communication**

Following Daft and Weick's (1984) three stages in organisational learning, a project viewed as a learning organisation suggests three types of communication are required to connect a project to its environment. Hence, a third zone of communication is recognised, between the zones of participation and connectivity.

The purposes of communication in this new zone are different from communication in the zones of participation and connectivity. Communication in this new zone is concerned with the interpretation of new information and with engaging participants. The third zone of communication enhances the conceptual framework, as shown in Fig. 2.7.

Organisational learning, as illustrated by Daft and Weick's (1984), included a feedback loop:

“The act of learning also provides new data for interpretation. Feedback from organizational actions may provide new collective insights for coalition members.

Thus the three stages are interconnected through a feedback loop...” (ibid. p286).

The feedback required for organisational learning reflects the feedback emphasised in agile approaches and by Cadle and Yeates (2008). The feedback loop indicates communication is required in both directions – outwards from the project and inwards from the environment – and needs to flow across perceptions of a project boundary. For this reason, the boundary of each zone is illustrated with a broken line, and the underlying framework is enhanced, as shown in Fig. 2.7.

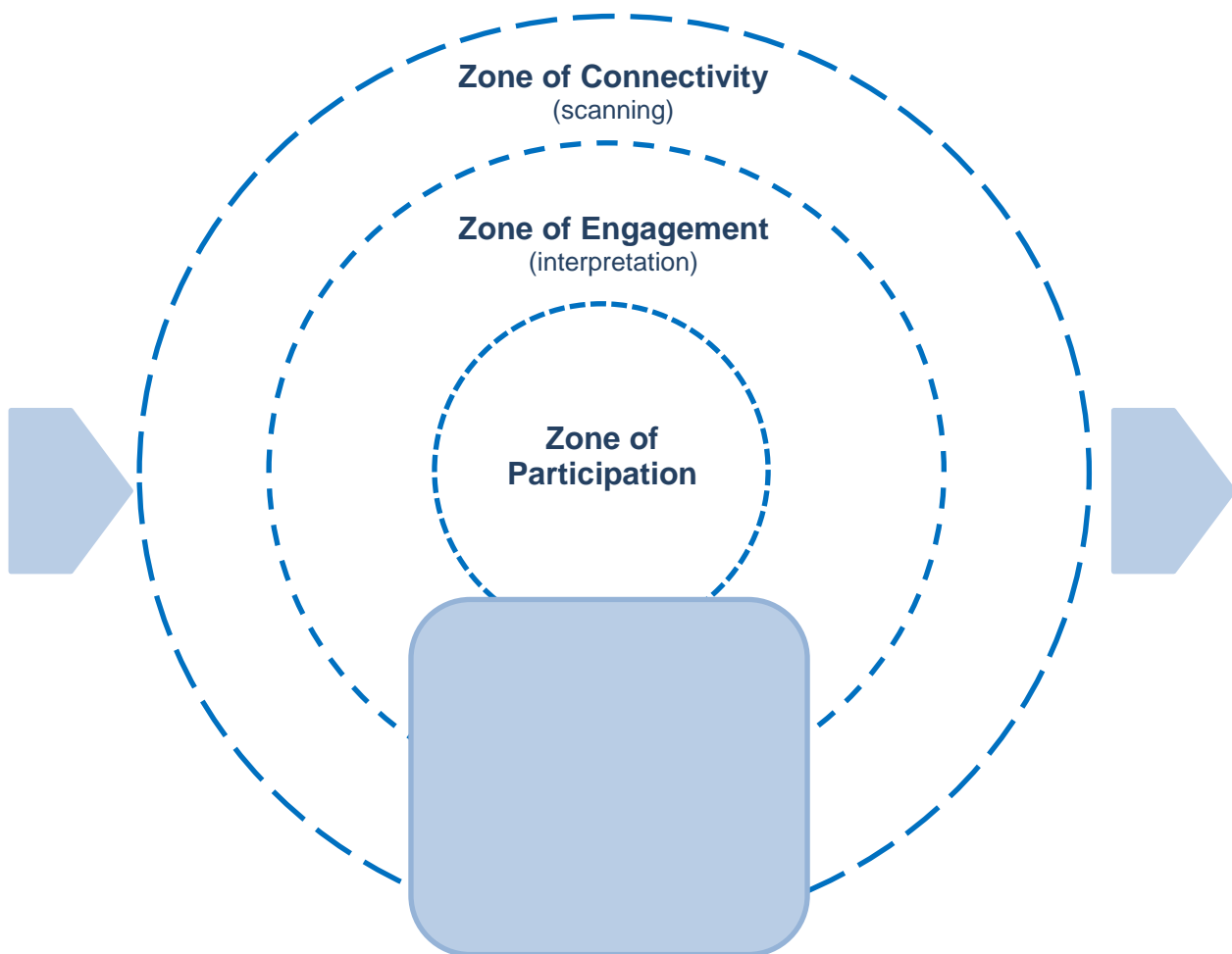


Fig 2.7 Initial conceptualisation of three zones of project communication



## Single and double loop learning

Three levels and two feedback loops are features of organisational learning as depicted by Daft and Weick (1984). Three levels of reflection and two feedback loops are also a feature of double loop learning (Argyris and Schön 1978). Single loop learning involves reflection that connects the consequences of action to strategies and the “emphasis [is] on techniques and improving efficiency” (Thompson 2009, p.14). In contrast, double loop learning:

“Involves questioning assumptions behind goals and strategies  
Modifies norms that define effective performance ... [and]  
Considers ‘notions of the good’ “.  
(Thompson 2009, p.15)

Double loop learning has been used to challenge the reflective process typically undertaken in projects (Dalcher 2016a, Thompson 2009, Thompson 2005). Commenting on a continuing trend of project failing to deliver expected results, Dalcher (2016a, p.806) suggests:

“a review of the underpinning theory and the expectations that it encourages by questioning the framing and the underlying systems expected to deliver the results”.

Therefore, double loop learning is consistent with three levels of communication and supports a requirement for learning and feedback in all three zones.

## Situated learning and communities of practice

Another perspective from the field of organisational learning that has been applied to projects is the concept of situated learning and its construct of communities of practice (CoP). Building on the work of Sense (2004), Jugdev and Mathur (2013) applied situated learning theory to project management practice and concluded that situated learning theory is well suited to contribute to an understanding of shared learning in projects. Situated learning and CoP are facilitating attempts to understand how different contexts impact learning (Lave and Wenger 1991, Brown and Duguid 1991). These concepts are used here to extend further understanding of the requirements for three zones of project communication.

The concept of communities of practice (CoP) has been influential in the field of organisational learning but is ambiguous. Communities of practice, as presented by Lave and Wenger (1991), is an approach to understanding learning derived from cases of apprenticeship learning. One interpretation sees a community of practice as a

unified, neatly bounded group, although it has been argued that a more subtle concept was intended (Cox 2005). A neatly bounded group has some correspondence with a project team in a conventional approach to managing a project. However, Lave and Wenger's (1991) concept emphasised the reproduction of existing knowledge (Cox 2005), whereas a project usually necessitates creating new knowledge as well as the transfer of existing knowledge. Brown and Duguid's (1991) paper on CoP on the other hand, emphasises "improvising new knowledge in an interstitial group that forms in resistance to management" and the concept of a CoP "seems relatively homogenous, without different levels of participation" (Cox 2005, p.527 & 530). This construct does not seem to be readily transferable to a project because a project team is usually established by management, rather than forming in resistance to management. However, projects can be seen as existing interstitially in relation to established organisations and management of existing business processes. In this sense project management can be said to be in resistance to business-as-usual management. Indeed, P3 Management (APM 2012) recognised that changes brought about by a project will affect business-as-usual and there may be resistance from some groups of stakeholders.

Communities of Practice (CoP) have been linked to managing projects and it has been suggested that the power of such communities:

"lies in their ability to develop strong relationships and trust, a prerequisite for effective communications" (Remidez and Jones 2012, p.33).

Wenger (2000, p.225) argued that the success of an organisation depends on its ability to design itself as a social learning system and distinguished between three "modes of belonging" by which individuals participate in social learning systems. Validation of Wenger's (2000) three modes of belonging is limited. Brosnan and Burgess (2003) used the modes to analyse a Web-based continuing professional development course and they concluded that the concepts provided a useful evaluation framework and design paradigm. Wenger's (2000) modes are used here to extend the concept of learning in a project and therefore contribute to an understanding of communication in the zone of participation.

The first of Wenger's (2000) modes is "engagement: doing things together, talking, producing artefacts" (ibid., p.227). Project objectives are achieved through activities undertaken by the team and products are created, so engagement activities are one way team members participate in a project. These types of activities are the subject of formal project processes, as illustrated by the use of Product Breakdown Structures and Work Breakdown Structures that decompose a project and are prescribed in many

approaches to managing a project. However, the social processes involved with engagement are not explicitly built into tasks or processes in dominant project management literature (Reich and Wee 2006).

Imagination and alignment are the other two modes of belonging, defined respectively as:

“Imagination: constructing an image of ourselves, of our communities, and of the world, in order to orient ourselves, to reflect on our situation, and to explore possibilities....

Alignment: making sure that our local activities are sufficiently aligned with other processes so that they can be effective beyond our own engagement” (Wenger 2000, p.228).

These modes suggest activities that will integrate work and connect individuals to the collective work of the project, as well as contribute to connecting a project to its environment. Negotiating boundaries is concerned with ensuring the work done as part of a project is effective beyond the project itself. Increasingly, the impact of a project is measured terms, such as value to the business and future potential (e.g. Dalcher 2008). Imagination and alignment can therefore be seen as extending the concept of participation in relation to learning and project success.

Wenger (2000) focussed on learning within communities, whereas Oborn and Dawson (2010) researched learning between different communities of practice. Projects are often multi-disciplinary and bring together individuals from a range of professional areas. A project typically brings together individuals from different professional disciplines, such as finance, IS/IT etc. and they suggest that individuals may associate with a CoP specific to their discipline even when working on a project. Therefore, research on learning between CoPs is relevant on a project. Oborn and Dawson (2010) examined the process of learning across communities of practice and found that

“multidisciplinary collaboration is not so much to learn *from* each others’ talk, but to learn *to* talk in this new arena ... [and they] identify three practices which facilitate learning across CoPs: organizing discussions, acknowledging other perspectives and challenging assumptions.” (Oborn and Dawson 2010, p.843 original emphasis).

The three practices identified by Oborn and Dawson (2010) are concerned with interpretations of the project and the external environment and are therefore added to the activities in the Zone of Engagement.

## Social communication in projects

Three zones of communication have some similarity with the three levels of 'social' communication suggested by Taylor (2016). Taylor (2016, p.2) proposes three "types or themes of project conversations". "Social within project", the first of Taylor's (2016) conversations, is described as

"communication about the project components, the tasks, the activities, the challenges and the team members themselves, the mechanics of meetings and reports and briefings, together with the deliverables and benefits." (ibid., p.3)

This first theme is similar to the Zone of Participation, although meetings are not included in Participation. Meetings might include conversations about project work, as well as providing an opportunity to clarify understandings and interpretations. For this work, meetings are included in the Zone of Engagement.

Taylor's (2016) second and third themes are "social about project" and "social around project". These two themes are about "ensuring that your project is well known" (ibid., p.4) and "human to human interaction ... [that] ... helps bond team members" respectively; and can be seen to reflect activities included in the Zones of Engagement and Connectivity.

Overall, Taylor's (2016) themes emphasise the social dimension of communication in projects, and provide support the suggestions about communication in this work. All the activities identified in the three zones of communication are now shown in the conceptual framework in Fig. 2.8.



Fig 2.8 Three zones of project communication

This review now turns to the second domain of this work, social media. Social media are defined as “socio-technical systems” (Zhao et al 2013, p.290), and incorporate both the technical and human components of systems. The next part of the review begins with an introduction to the human dimension of social media and argues the world is now hyper-connected.

## 2.5 Social media and mobile technologies

Technically social media are defined in relation to Web 2.0, and the technology is related to the capability for “social interaction, communication, collaboration and community formation” (Zhao et al 2013, p.290). It is argued that it is the growth of mobile technologies combined with the development of social media has created a paradigm shift in communication practices (e.g. Dutta and Bilbao-Osorio 2012, Daley 2010, Ryberg 2008). Howard-Jones (2011) explains:

“Our lives have become increasingly immersed in technology. Much of our communication is now online ...and many of us find our mobile phones have become an essential part of our connectivity and everyday organisation.”  
(Howard-Jones, 2011, p. 5)

This perspective view is echoed in project management literature:

“... social media isn't just another technology but something that enables entirely new ways of working. People think, act, and communicate in different ways. With social media it's about human beings doing what they do best, that is to socialize and to share.” (Van der Merwe 2016, p. 144)

Hyperconnectivity is a term that has been coined in response to the rapid availability of entirely new ways to communicate as explained, for example, by Dutta and Bilbao-Osorio (2012, p.xvii, original spelling):

“Hyperconnectivity refers not only to the means of communication and interaction, but also to the impact this phenomenon has on both personal and organizational behavior.”

### Hyperconnectivity

“The vanguard of our advance into this new world is our children, and especially our teenagers. ...the developing brain ... is more plastic, and responds more malleably to experience than an adult's brain.” (Howard-Jones, 2011, p. 5)

Prensky (2001) coined the term “digital native” for generations that have

“spent their entire lives surrounded by and using computers, videogames, digital music players, video cams, cell phones and all the other toys and tools of the digital age...” (ibid., p.1)

He argues “a really big *discontinuity* has taken place” (ibid.) in relation to the arrival and rapid dissemination of digital technology, and

“as a result of this ubiquitous environment and the sheer volume of their interactions with it, today’s students *think and process information fundamentally differently* from their predecessors.” (ibid., original italics)

The term digital native is neither linked to a specific generation (e.g. Generation Y), nor did Prensky (2001) define an age range. Here, the term is used in the present work to mean those who have been using social media and mobile technology to communicate and collaborate with their peers from their teenage years, hence those born after 1990.

The overall impact of hyperconnectivity is hotly debated, and there is no high quality evidence that social media has either positive or negative effects on young people (Przybylski 2017). A wide range of effects are suggested, as illustrated here:

“Analysts generally believe many young people growing up in today’s networked world and counting on the internet as their external brain will be nimble analysts and decision-makers who will do well. But these experts also expect that constantly connected teens and young adults will thirst for instant gratification and often make quick, shallow choices” (Anderson and Rainie 2012, p1).

Amongst digital natives, the impact of social media on communication practices has been discussed by, amongst others, Przybylski (2017) who said, “there is a whole universe of other conversations that are literally at [their] fingertips”. Some insights are provided by the young people interviewed by Winston and Byron (2017) about social media, for example:

“It’s made us much more interconnected and aware of what’s going on.” (Ivo, in Winston and Byron 2017)

“It’s enabled people to have conversations that they wouldn’t otherwise have had.” (Adam, in Winston and Byron 2017)

The use of social media is not limited to a young generation, but as the proportion of such young people in the workplace grows, so too will the possibility of changes to working practices as a result of the use of social media. There is already some evidence to suggest that a young generation is driving use of social media in the workplace (e.g. AON Consulting 2009). The impact of mobile technologies and social media on work practices and informal interactions in virtual workspaces is only just starting to be understood (Fayard and Weeks 2011).

Computer Supported Cooperative Work (CSCW) is a mature field of research and might provide a starting point. However, changes that have taken place in the world since the community was formed, mean that each word in the name CSCW “has lost its relevance” (Grudin 2010, p.38). Digital convergence has been widely discussed (e.g. Hollocks 1994) and as Grudin (2010, p.40) notes “Technologies bleed from one to the other more rapidly” and the “barriers between work and non-work activities are ever fuzzier.” Specifically, “digital technology is no longer confined to a support role” (ibid.) and systems capable of supporting groups are no longer only affordable in corporate work settings (Grudin 2010, p.40). Mobile technologies and social media are now widely used in the workplace and social settings.

Classifications of social media have been developed using characteristics of the technology, such as the classification using pre-existing concepts such as media richness (Daft and Lengel 1986), or the functional building blocks of presence, relationships, reputation, groups, conversations, sharing and identity suggested by Keitzmann et al (2011). Existing classifications of social media focus primarily on the characteristics of the technology and have been developed to inform understanding and guide future development of social media but their value in understanding use of social media is limited.

There has been some professional commentary on the types of social technologies that can be deployed in enterprise settings (e.g. Harrin 2010a, APM 2014) and surveys of professionals (e.g. Bughin et al 2011). One study by Gimpel et al (2014) has been identified in academic literature, and there is a collection of commentaries from the academic community in Silvius (2016). Both the professional and academic sources have been used to develop a taxonomy of social media that are relevant to managing projects, thereby addressing the first research objective.

### **A taxonomy of social media for a project setting**

Social media for project managers was the focus of Harrin’s professional commentary (2010a, 2010b, 2011). From her own experience, she identified and defined ten types of social media that are available to project managers: Blogs, collaboration tools, instant messaging, microblog, social networks, wiki, podcasts, really simple syndication (RSS), vodcasts and webinars (Harrin 2010a). In contrast, although also from a professional source rather than rigorous academic research, Bughin et al (2011) surveyed executives from a range of industries on the way organisations use social tools and technologies. Bughin et al’s (2011) survey found 72% of the 4,261 respondents reported their company was using at least one social technology. They



identified four types of technology and indicated the percentage of respondents indicating use in their organisation (shown in brackets):

- Social networking (50%)
- Blogs (41%)
- Video sharing (38%)
- Microblogging (23%).

Bughin et al (2011) did not provide definitions of the terms used. However, social networking, blogs and microblogging can be considered to correlate with three types defined by Harrin (2010a). A link to a video hosted online can be incorporated into an email, blog, microblog or message sent using social networks, and therefore video sharing is not considered a separate type of technology. A similar survey of executives two years later indicated the proportion of respondents using at least one social technology had increased to 83% (Bughin et al 2013). In total, thirteen types of technology were identified in the 2013 survey and Bughin et al (2013) concluded that the use of social tools and technologies has become mainstream. Of the thirteen, the ten types that were reported by more than 20% of respondents are identified here:

- Online video conferencing (61%)
- Social networking (58%)
- Collaborative document editing (44%)
- Video sharing (42%)
- Blogs (41%)
- RSS (26%)
- Podcasts (24%)
- Wikis (24%)
- Microblogging (23%)
- Tagging (21%).

(Bughin et al 2013).

Social collaboration in project work was the subject of empirical research by Gimpel et al (2014), who initially used expert interviews to identify seven social technologies (as shown in Table 2.2). The perceptions of more than 200 experienced users, about half of whom were project managers, were then investigated and they found that all seven technologies are relevant to project work. The seven technologies identified by Gimpel et al (2014) have been correlated with the types identified elsewhere. Correlations were found for six types of technology. A seventh construct representing the technologies that deliver a stream of updates incorporating text, audio, images and video media has been created by combining three types identified by Harrin (2010a) –

podcast, RSS and vodcast – with Gimpel et al's (2014) newsfeed. Online meetings is the eighth construct that has been developed by combining Webinars, identified by Harrin (2010a), and online video conferencing identified by Bughin et al (2013). A ninth type of technology is identified by AMP (2014) – events calendar, such as Doodle, and task scheduling tools such as Trello. The comparison of different sources is shown in Table 2.2.

Table 2.2 Comparison of social technologies relevant to project work

<b>Technology type</b>	<b>APM (2014)</b>	<b>Gimpel et al (2014, p.4)</b>	<b>Bughin et al (2013)</b>	<b>Harrin (2010a)</b>	<b>Example (Gimpel et al 2014)</b>
<b>Blog</b>		<b>Weblog</b> “(for short: blog) is a public diary by one or multiple authors. Typically, new content regarding a certain topic is published periodically and displayed in reverse chronological order (newest post at first).”	<b>Blogs</b>	<b>Blogs</b> “A blog (short for web log) is an online diary. In a project setting, it is the equivalent to a project notebook or a shared project log. Blogs are made up of posts, which are short articles that appear in reverse chronological order on the blog.” (ibid., p. 17)	WordPress  Blogger.com
<b>Shared workspace</b>	<b>Collaboration tools</b>	<b>Shared workspace</b> “is a structured collection of information objects such as documents, articles and others for shared usage within a certain group (teamwork).”	<b>Collaborative document editing</b>	<b>Collaboration tools</b> “are software solutions that are designed to help manage teams and get the job done. They tend to encourage storing of all project information, contacts, documents, and discussion in one place, or have the ability to pull in feeds from elsewhere as required.” (ibid., p.18)	SharePoint  OneDrive
<b>Instant Messenger (IM)</b>		<b>Instant messenger</b> “enables a text-based synchronal communication between different communication partners.”	-	<b>Instant Messaging</b> “(also known as chat) is a way of sending short text messages to colleagues through the computer. (ibid., p.20)	Lync  Skype
<b>Micro blog</b>		<b>Microblogging</b> “A micro blogging service offers the possibility to post short text messages regarding a specific topic.”	<b>Microblogging</b>	<b>Microblog</b> “Microblogging is (as you might expect) blogging on a very small scale. It allows you to send short messages to the internet for public consumption.” (ibid., p.22)	Twitter  Tumblr
<b>Social network</b>	<b>Discursive platform / social platforms</b>	<b>Social network</b> “is a platform for establishing, maintaining and organizing contacts and exchanging user-generated contents messages.”	<b>Social network</b>	<b>Social networks</b> “are online groups that are designed to bring people with common interests together. You can connect with friends that you know both in the real world and those friends that you have never met.” (ibid., p.26)	Yammer  LinkedIn  Facebook

<b>Technology type</b>		<b>Gimpel et al (2014, p.4)</b>	<b>Bughin et al (2013)</b>	<b>Harrin (2010a)</b>	<b>Example (Gimpel et al 2014)</b>
<b>Wiki</b>		<b>Wiki</b> “is a web-based application for collaborative work such as creating, editing or amending texts.”	<b>Wikis</b>	<b>Wiki</b> “is a collection of web pages that are written by a group of people, normally on a particular topic” (ibid., p.30)	Wikipedia
<b>Newsfeed/ Podcast / Vodcast</b>		<b>Newsfeed</b> “A newsfeed transforms changes to a website into a machine-readable format. This documentation is stored in a URL (the newsfeed) and can be read by an aggregator. The processed updates are displayed to the user in a news stream.”	<b>Video sharing</b>  <b>Podcasts</b>  <b>RSS</b>	<b>Podcasts</b> “A podcast is an on-demand audio file delivered regularly through a mechanism that allows people to subscribe to the latest episode, like RSS” (ibid., p.24)  <b>RSS</b> Really Simple Syndication. “information is sent to multiple channels at a time” (ibid., p25)  <b>Vodcasts</b> “A vodcast is a video podcast” (ibid., p28)	RSSFeed  Podcast
<b>Online meeting</b>		-	<b>Online video conferencing</b>	<b>Webinars</b> “a webinar is a seminar hosted on the web. It is also used to describe other types of meeting where participants go to a website to see the presentation material.” (ibid., p.29)	-
<b>Calendar / task scheduling tools</b>	<b>Events calendar / task scheduling</b> “... to organise meetings or ... to organise and manage work streams” (ibid., p.2)	-	-	-	Doodle  Trello

Table 2.2 Comparison of social technologies relevant to project work (contd.)

Accordingly, nine technology types are defined for this work as identified in Table 2.3.

Table 2.3. Types of social technology

	<b>Technology</b>	<b>Definition</b>
1.	Blog	a public diary by one or multiple authors displayed in reverse chronological order
2.	Shared workspace	a structured collection of information objects
3.	Instant messages	text-based synchronous communication between communication partners
4.	Microblog	very short messages shared on the internet for public consumption
5.	Social network	a platform for establishing, maintaining and organizing contacts and exchanging user-generated content
6.	Wiki	online collaborative work space
7.	Newsfeed/Podcast/Vodcast	on demand text, audio or video news stream
8.	Online meeting	a meeting hosted online, incorporating audio and video online conferencing that may include screen sharing, and webinars
9.	Events calendar / task scheduling tools	Software used to organise meetings or manage work streams

All the nine types of social media can be accessed from desktop computers and mobile devices, using a web sites or a mobile app. A mobile app is defined as a

“a computer program or piece of software designed for a particular purpose that you can download onto a mobile phone or other mobile device” (Cambridge Dictionary 2016).

None of the literature used in developing typology of social media distinguish between different types of access; perhaps because of the ubiquity of mobile devices, and perhaps compounded by the blurring of work and non-work. The ubiquity of mobile devices and their role in hyperconnectivity is recognised. The typology of nine social media that are relevant to managing projects is shown within the conceptual framework in Fig. 2.9.

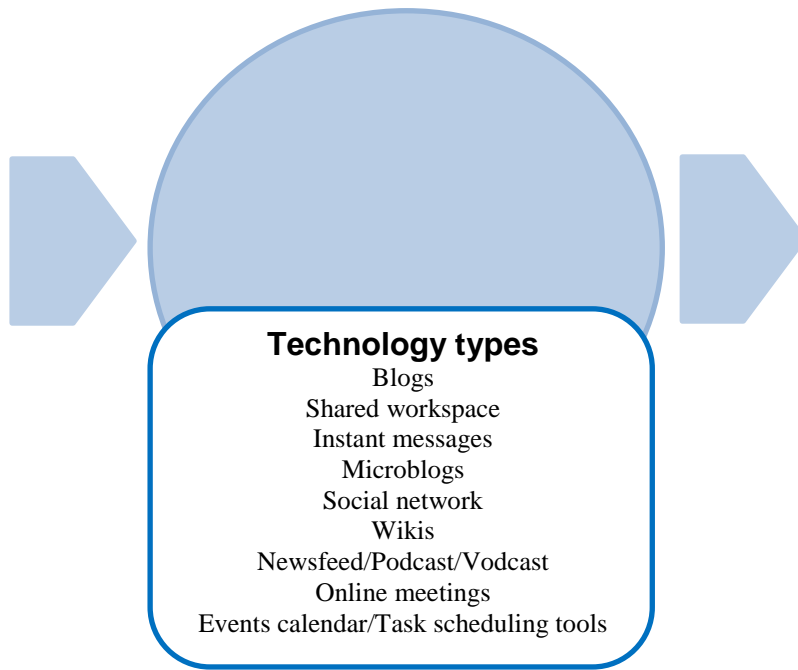


Fig 2.9 Types of social technology

Next, the context for using social media in project settings is addressed and the factors influencing adoption and use are catalogued, thereby addressing the second research objective.

## 2.6 Factors influencing adoption and use of social media

Technology adoption is a mature field of research. Many models of technology adoption and use have been developed and amongst the most influential are Davis' (1989) Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT), developed by Venkatesh et al (2003). TAM shows that perceptions of the technology, as well as external variables, influenced attitude towards using technology, and that attitude in turn influenced use through intention to use. Both TAM and UTAUT draw on frameworks where attitude is recognised to influence behaviour, and attitude incorporates cognitive, affective and behavioural components (McGuire 1969, Ajzen 1991) and these three dimensions are consistent with a socially constructed view of reality.

The results of research on the antecedents of technology use have changed over time, as technology and its uses have changed. UTAUT (Venkatesh et al 2003) includes determinants and moderating factors, classified into four groups:

- Perceptions of the technology (effort expectancy and performance expectancy)
- Characteristics of the individual ( gender, age, experience and voluntariness of use)
- Social influence
- Facilitating conditions.

Brown et al (2010) combined UTAUT with collaboration constructs to develop a model for predicting use of collaboration technologies. In their model, influences are identified in categories similar to those above, with the addition of task characteristics. Task-technology fit (Goodhue and Thompson 1995) suggests the characteristics of a task will influence technology use, and task characteristics are also suggested by Bok et al (2012). Building on the notion of task, research by Müller (2003) suggests characteristics of a project will influence communication preferences and therefore, by extension, technology use.

Kügler et al (2013) consider employees' use of Enterprise Social Software Platforms (ESSP) and suggest use is influenced by factors from three categories – technological, social and organisational. At present, empirical studies on the adoption of ESSP is rather limited. Kügler et al's (2013) work does not consider the nature of a task and work on validating their model is at an early stage. Furthermore, research on technology adoption in an enterprise setting has tended to focus on the adoption of specific technology prescribed by the organisation. Research on use of social

technology in a virtual team by Giltenane (2016) indicates the UTAUT model can “successfully predict behavioural intention” (ibid., p.94).

For this work, the factors influencing the social media adoption and use are grouped together in four categories: technological characteristics, individual and group characteristics, task and project characteristics, and characteristics of the situation. The four categories of influences address research objective two and are added to the conceptual framework as shown in Fig. 2.10. The characteristics within each category are investigated in turn in the remainder of this section.

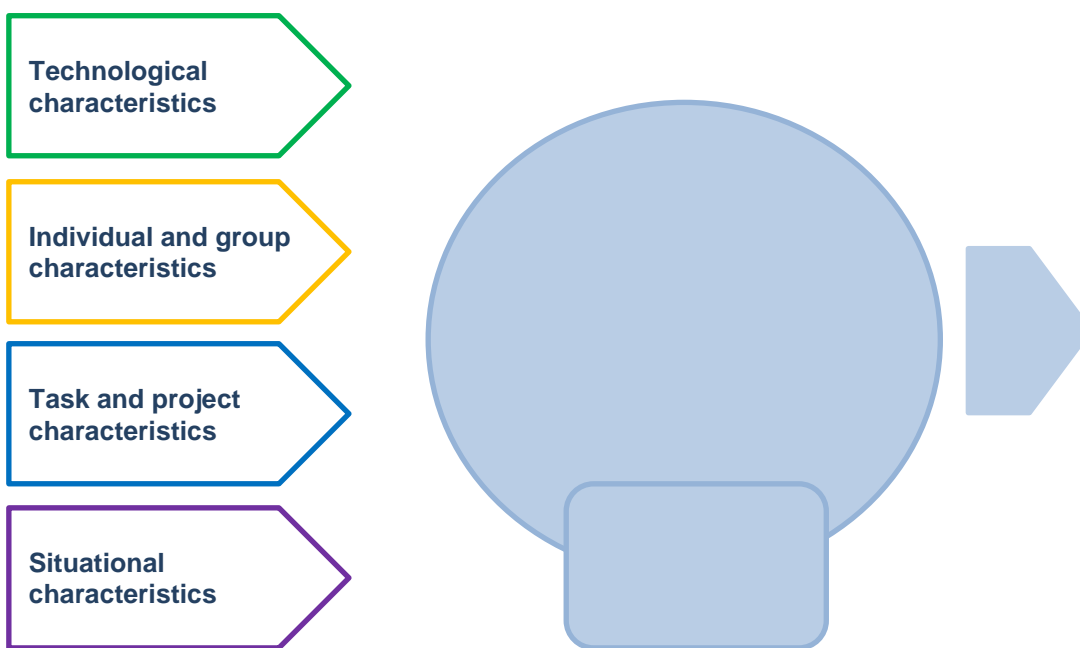


Fig 2.10 Four categories of factors influencing use of social media on projects



## Technological characteristics

Kügler et al (2013) identify perceptions of using a technology rather than characteristics of the technology itself. Following Kügler et al (2013), here the technological factors are defined as perceptions of using social technologies rather than perceptions of the technologies themselves.

Four technological factors were identified by Kügler et al (2013). “**Ease of use**” (Kügler et al 2013, p. 3637) is defined as the degree to which a user perceives the technology “to be free of physical and mental effort” (ibid.) and is similar to effort expectancy from UTAUT (Venkatesh et al 2003, Brown et al 2010). “Relative advantage” (ibid. p. 3637) is defined as users’ perceptions of the “job-related benefits of the technology” (ibid.) and is similar to the notion of **perceived usefulness** as represented in TAM and TAM2 (Venkatesh and Bala 2008) and performance expectancy from UTAUT (Venkatesh et al 2003, Brown et al 2010). “**Results demonstrability**” (Kügler et al 2013, p. 3637) is the degree to which the result of using a technology is “observable and communicable to others” (ibid.). “**Compatibility**” was the fourth factor identified by Kügler et al (2013, p. 3638) and is defined as the degree to which technology usage “is perceived as being consistent with the existing values, needs and past experiences” (ibid.) of users. Kügler et al’s (2013) work is conceptual and has yet to be tested empirically.

Giltenane’s (2016) research on use of social media in a virtual team confirmed performance expectancy and effort expectancy from UTAUT as independent variables influencing technology use.

Brown et al (2010) added three technology characteristics to UTAUT: social presence, immediacy and concurrency. **Social presence** refers to the ability of a technology to convey the psychological impression of the physical presence of users (Short et al 1976), such as non-word cues (e.g. voice tone) and non-verbal cues (e.g. facial expression) (Brown et al 2010). **Immediacy** refers to how quickly a collaboration technology enables the user to communicate with others. Both social presence and immediacy are socially experienced and have “long been linked to perceptions of performance and user satisfaction” (Brown et al 2010, p.41). **Concurrency** is the ability of a technology “to enable an individual to perform other tasks at the same time as using the technology” (Brown et al 2010, p.21). Brown et al (2010) conducted two studies and concluded that all three characteristics “are important factors influencing the adoption and use of collaboration technology” (ibid., p.41).

APM (2014) provide a briefing for practitioners on social media in project management. One issue highlighted by APM (2014) is privacy and they suggest **security** is a factor influencing decisions around use, or not, of social media.

Thus, eight technological factors are included in the conceptual model for this research as shown in Fig. 2.11.

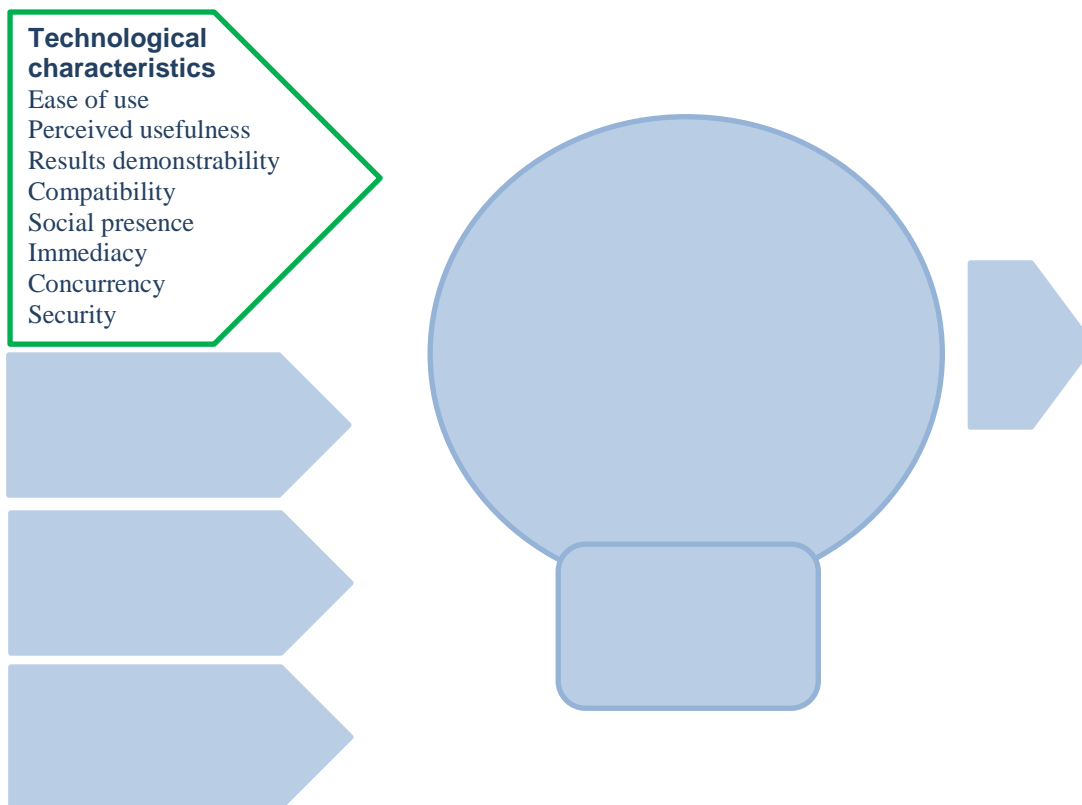


Fig 2.11 Technological characteristics influencing use of social media

### Individual and group characteristics

Characteristics of individual users of technology have featured in a range of models of technology adoption and use. Brown et al (2010) identified factors in a category called "individual and group characteristics" (ibid., p.16). Kügler et al (2013) identified social factors and organisational climate (sic.), suggesting characteristics of a group, as well as the individual, may be relevant. Hence, Brown et al's (2010) terminology is used for this grouping of factors.

TAM and UTAUT both recognize that experience of using technology influences attitudes towards and actual use. A distinction is made between intention to use and actual use, however, other research suggests that

“utilizing actual system usage measures may provide greater explanatory power than measures based on intention to use a technology” (Kügler et al 2013, p.3637).

Therefore, the view is adopted here is that system use incorporates intention as well as actual use.

Brown et al (2010) identified collaboration technology experience and computer self-efficacy as constructs that influence adoption and use of collaboration technologies. Kügler et al (2013) developed the construct “private social software experience” (ibid. p.3639) to address the phenomenon that “many employees already know social software from the private realm” (ibid.) and suggested that such experience has a mediating effect on the influence of technological and social factors. Prior experience is therefore a factor that incorporates prior use of social media incorporating both work and non-work settings.

One issue with social media highlighted by APM (2014) is time, because

“most project professionals and teams ... feel unable to spend the time required to develop a sufficient level of competence on social media to make its use worthwhile.” (APM 2014, p. 2)

This issue recognises that two factors already identified, **prior experience** and **technology self-efficacy**, have an influence on use of technology.

UTAUT includes **social influence** and this is confirmed by Giltenane (2016) as an influence on the adoption and use of social media. “Familiarity with others” and “peer influence” are collaboration-related constructs identified as characteristics of the individual and group, and of the situation respectively by Brown et al (2010, p.16). For this work, both constructs are correlated with social influence. Kügler et al (2013) identified community ties, defined as perceptions of “strong social ties to their co-workers and a feeling of closeness to each other” (ibid. p.3639), and is also correlated with social influence in this work.

Kügler et al (2013) refer to **collaboration norms** as “the degree of consensus in the organisation concerning cooperation, collaboration and teamwork” (ibid., p. 3639). Collaboration norms are consistent with the concept of relational norms as used by Müller (2003, p.347).

**Trust** is “recognized as a key antecedent of effective knowledge exchange” (Kügler et al (2013, p. 3639) and therefore suggested as a factor within organisational climate by

Kügler et al (2013). They define trust as “the degree of belief in good intentions, behaviours, competence, and integrity of employees” (ibid.). Giltenane (2016) confirms team trust as having a positive impact on “behavioural intent to use social media technology in a virtual team environment” (ibid., p.94).

Two social factors were identified by Kügler et al (2013). **Reputation** refers to the degree to which usage is “perceived to enhance an employee’s image or reputation within his/her social system” (Kügler et al 2013, p. 3638). **Perceived critical mass** is defined as “the degree to which ESSP usage is perceived to be visible in the organization.” (Kügler et al 2013, p. 3638). For this work, a group of people brought together for a project is a social system and an organisation. Therefore, although not yet supported by empirical research, both factors are included here as characteristics of a group.

In UTAUT, **age** and **gender** are moderating factors and their influence is confirmed by Brown et al (2010) and by Giltenane (2016). Job role was also identified by Giltenane (2016) but was not supported by research.

Thus, nine individual and group characteristics are included as factors likely to influence the adoption and use of social media, as shown in Fig. 2.12.

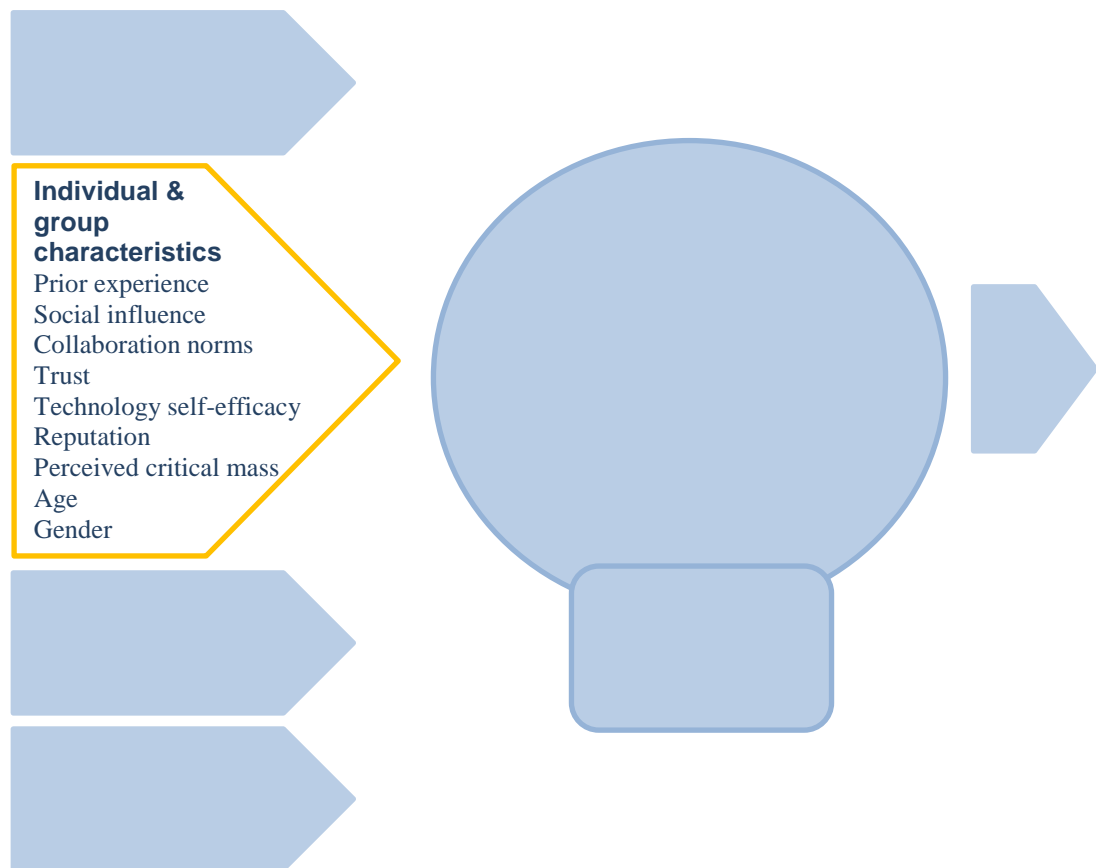


Fig 2.12 Individual and group characteristics influencing use of social media

### Task and project characteristics

Task-technology fit (TTF) theory (Goodhue and Thompson 1995) asserts that:

“for an information technology to have a positive impact on individual performance, the technology must ... be a good fit with the task it supports” (ibid., p213).

It follows that **task type** seems likely to be a factor that influences use of social media. Brown et al (2010) distinguish between decision-making and idea generation and found the effects of technology characteristics varied for the two task types. In contrast, Bok et al (2012) found the task characteristics **immediacy, complexity and urgency** influenced media choice.

The communications preferences of IS/IT project managers were the subject of research by Müller (2003). He suggests the characteristics of a project may influence

communication practices. One determinant investigated by Müller (2003) was **project risk**. He defined project risk as clarity of goal and clarity of method, and found project risk has an influence on communications frequency and medium. Project risk is therefore included as a factor likely to influence use of social media in project environments.

Accordingly, five characteristics of task and project are likely to influence the adoption and use of social media, as shown in Fig. 2.13.

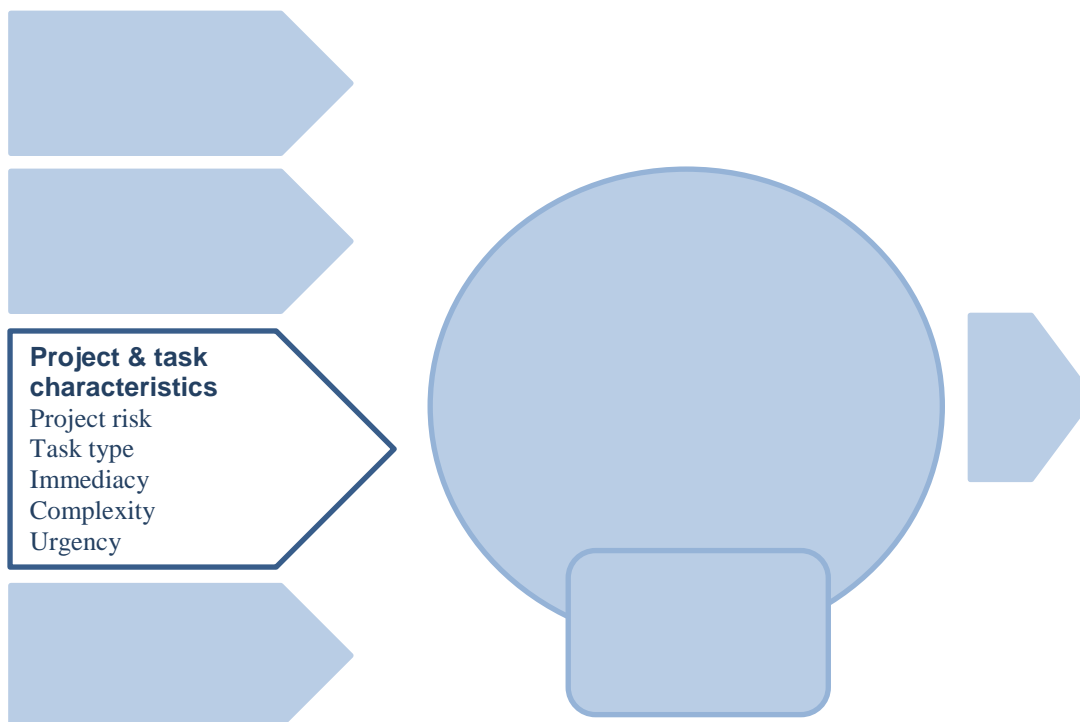


Fig 2.13 Project and task characteristics influencing use of social media

### Situational characteristics

The challenges of implementing social tools on projects are not limited to characteristics of the technology or their use, as suggested by Van der Merwe (2016):

“The challenge of bringing in social tools is not because of the technical nature of using the tools themselves, but the cultural change that is necessary to be successful.” (Van der Merwe 2016, p.144)

UTAUT includes the influence of facilitating conditions, defined as

“the extent to which the individual believes the organization and technical infrastructure support use of the system” (Brown et al 2010, p. 17).

Brown et al (2010) expand the notion of facilitating conditions using collaboration-related constructs to identify **resource-facilitating and technology-facilitating conditions**. Organisational contingency theory (Shepard 1978) has been used to explain project failure (Sauser et al 2009) and supports the view that facilitating conditions influence technology use.

Under social influence, Brown et al (2010) identify peer influence and superior influence. Peer influence is included above as a group characteristic. Although their research did not extend to testing superior influence, management support is widely considered to be a project success factor and therefore **management influence** is included here as a situational characteristic.

“Embedding” is an issue with social media suggested by APM (2014). Embedding is the challenge of changing established working practices (APM 2014), and this is reflected in Van der Merwe’s (2016, p.144) comment about a requirement for “cultural change”. APM (2014, p.2) suggest there is a need for a “critical mass of contributors to make use of the platform worthwhile”. The extent of use of a technology platform is likely to influence perceptions, as suggested by perceived critical mass and reputation (Kügler et al 2013), and is included here as a resource-facilitating condition. APM (2014) refer to time as an issue because

“most project professionals and teams ... feel unable to spend the time required to develop a sufficient level of competence on social media to make its use worthwhile.” (APM 2014, p. 2)

Hence, three situational characteristics are added to the conceptual framework, as shown in Fig. 2.14. A comparison of all factors can be seen in Table 2.4, showing how the second research objective has been addressed by previous work.

In the next section, the activities where social media are deployed are investigated and relevant activities are identified, thereby uncovering the behaviours involved in using social media to manage projects and addressing research objective three.

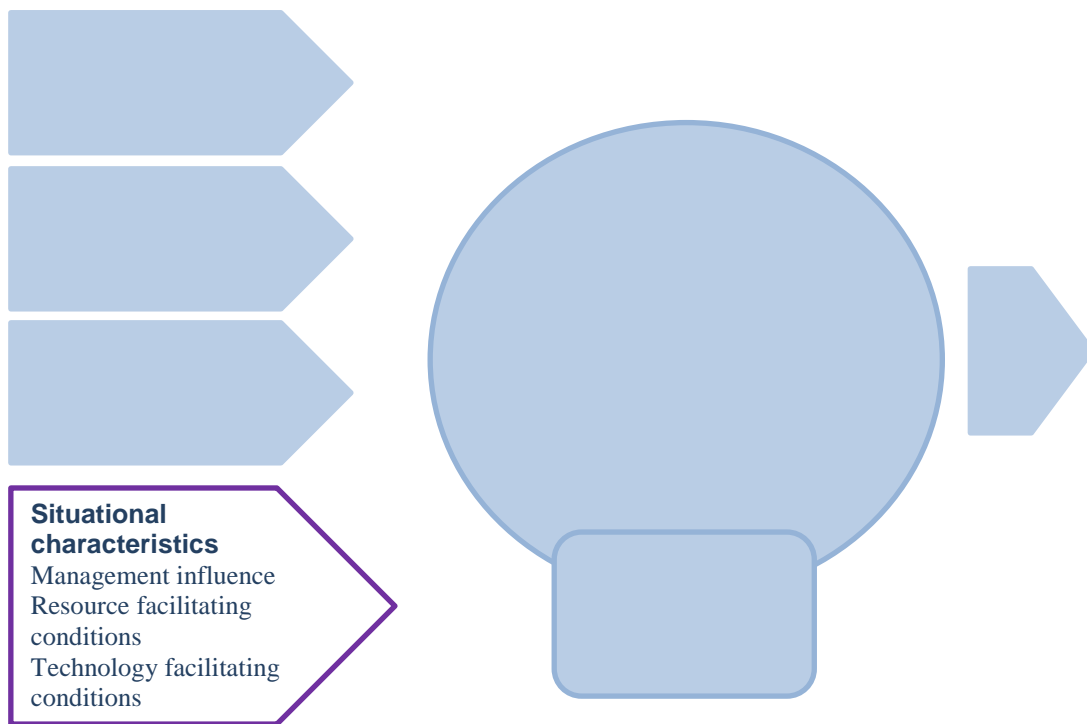


Fig 2.14 Situational characteristics influencing use of social media



Table 2.4 Factors influencing adoption and use of social media in projects

Characteristic	Giltenane (2016)	APM (2014)	Kügler et al (2013)	Bok et al (2012)	Brown et al (2010)	Venkatesh et al (2003)	Müller (2003)
<b>Technological</b>							
Ease of use	Effort expectancy		Ease of use		Effort expectancy	Effort expectancy	
Perceived usefulness	Performance expectancy		Relative advantage		Performance expectancy	Performance expectancy	
Compatibility			Compatibility				
Results demonstrability			Results demonstrability				
Social presence					Social presence		
Immediacy					Immediacy		
Concurrency					Concurrency		
Security		Security					
<b>Individual &amp; group</b>							
Prior experience	Experience	Time to develop competence	Private social software experience		Collaboration technology experience	Collaboration technology experience	
Social influence	Social influence		Community ties		Familiarity with others Peer influence	Social influence	
Collaboration norms			Collaboration norms				Relational norms
Trust	Team trust		Trust				
Technology self-efficacy		Time to develop competence			Computer self-efficacy		
Reputation		Embedding	Reputation				
Perceived critical mass		Embedding	Perceived critical mass				
Age	Age				Age	Age	
Gender	Gender				Gender		
						Gender	

<b>Characteristic</b>	Giltenane (2016)	APM (2014)	Kügler et al (2013)	Bok et al (2012)	Brown et al (2010)	Venkatesh et al (2003)	Müller (2003)
<b>Task &amp; project</b>							Clarity of goals
Project risk							Clarity of methods
Task type					Idea generation v decision-making		
Immediacy				Immediacy			
Complexity				Complexity			
Urgency				Urgency			
<b>Situational</b>							
Resource & technology conditions		Embedding			Resource & technology facilitating conditions	Facilitating conditions	
Management influence					Influence of superior		

Table 2.4 Factors influencing adoption and use of social media in projects (contd.)

## 2.7 Social media deployment in project management

For some technology types and to some extent, how the technology is used is implicit in the definition e.g. online meetings are used to run meetings where participants are connected online rather than in the same location. However, there has been little research explicitly linking the use of social technologies with managing projects.

Project management activities have long been supported by technology in the form of Project Management Information Systems (PMIS). Modern PMIS aim to provide “the decision-making support needed in planning, organizing and controlling projects” (Raymond and Bergeron 2014, p.1339). Research suggests that PMIS improve efficiency and effectiveness in managerial tasks in terms of better planning, scheduling, monitoring, control and timelier decision-making (ibid). As such, PMIS can be seen as reasserting a technical, rational model of projects and do not necessarily emphasize communication and human interaction. However, in “recognition of the important role of communication and the inadequacies of email” (Remidez and Jones 2012, p.35), some PMIS vendors have now incorporated some social media into their products.

### Project Management Information Systems (PMIS)

Remidez and Jones (2012) identified nine project management software vendors whose products incorporate social media and listed the dimensions along which they varied. The dimensions identified by Remidez and Jones (2012) have been mapped against the three zones of project communication in the framework proposed for this work, as shown in Table 2.5.

Nine of the dimensions are concerned with integrating work (1, 4, 5, 9, 10 & 11) or traditional project management activities (6, 8 & 12) and therefore have been mapped against the zone of participation. Four dimensions (2, 3, 7 & 13) seem to provide opportunities for connections to be made between a project and its environment, and have therefore been associated with the zone of connectivity. Dimensions 2 and 3, integrating with social networks, could provide opportunities for increasing awareness of a project beyond its boundary; and could be a communication channel whereby the project gains awareness of external changes. Dimension 13 may provide a communication channel that leads to an increased awareness of government legislation within the project.

Table 2.5 Correspondence between social media in PMIS and communication zones

	<b>Dimension of Social Media in PM Systems</b> (Remidez and Jones 2012)	<b>Zone of communication</b>	<b>Comment</b>
1.	Assumes a PM methodology(Agile etc.)	Participation	A methodology tends to be adopted by an individual project.
2.	Integration with enterprise-level social network	Connectivity	May enable project to learn about external change and could provide opportunities to raise external awareness of project. Potential for social interaction.
3.	Integrates with outside social networks	Connectivity	May enable project to learn about external change and could provide opportunities to raise external awareness of project. Potential for social interaction.
4.	Integrates with other collaborative systems (email, Microsoft Project Server etc.)	Participation	
5.	Integrates with existing network access and security systems	Participation	
6.	Multiple projects view for a PM	Participation	
7.	Portfolio view of all projects	Connectivity	Portfolios tend to be concerned with relationships between projects.
8.	Workflow management	Participation	
9.	Collaboration support (file sharing, wiki, blog etc.)	Participation	
10.	File permission control	Participation	
11.	Provides real time updates and links to social network members	Participation	Would seem to offer the potential for social interaction but the implied focus is conventional information sharing i.e. project updates.
12.	Support for traditional PM activities (Monte Carlo simulations, risk management, change control etc.)	Participation	
13.	Support for complying with government regulations (privacy laws, securities laws etc.)	Connectivity	

Analysis of the dimensions of social media in PMIS suggests there is a potential for social media to extend project communications in two different ways. First, through membership of online social networks, there is the possibility for social interaction between the people involved in a project. Dimension 11 implies that participants will be members of a social network, but the focus seems to be on sharing conventional project information such as status updates. A second way in which the dimensions suggested by Remidez and Jones (2012) could be used, is to provide channels of communication with people and organisations that are external to the project. Increasing external communication could increase the opportunities for learning about external change that could influence the project, and could increase the opportunities for sharing information about the project more widely. Remidez and Jones (2012) suggested that social media is affecting project management processes however they claim

“vendors have included or excluded support for activities based on many factors, none of which include rigorous research” (ibid. p35).

Remidez and Jones (2012) have suggested that communications delivered through social media are potentially a valuable resource for project managers. Project work, it has been claimed, relies on horizontal lines modes of authority to achieve collective work outcomes (e.g. Dahlander and O’Mahony 2011). It has been argued that social media and Web 2.0 tools can be seen as a materialisation of the sociological trends of networked individualism and horizontalisation of knowledge (Ryberg 2008, p.7).

Project management requires

“communication practices that go beyond transaction confirmation to include managing relationships, building trust, and managing stakeholder expectations” (Remidez and Jones 2012, p.33).

The importance of social processes to effective project knowledge management has been well recognized in literature (e.g. Gasik 2011, Reich and Wee 2006, Inkpen and Tsang 2005, Fetterhoff et al 2001, Nonaka and Konno 1998). Brookes et al (2006) developed a framework to delineate and relate social concepts, including ideas of social networks and social capital, to a project environment and their empirical research provided evidence that conducive relationships were strongly and significantly correlated with trust and respect. A community-based approach to managing knowledge has been highlighted (e.g. Bresnen et al 2003) and the role of positive relationships identified as a basic prerequisite for knowledge transfer (Gasik (2011). However, social processes and knowledge management are not the focus of the present work and are therefore not explored further here.

### Activities for social media in project management

Bughin et al (2011) surveyed use of Web 2.0 and suggested three categories of use for social media in companies – internal purposes; purposes related to customers and partners; suppliers and external-expert purposes. All three categories are potentially relevant to managing a project but Bughin et al (2011) did not identify activities within the categories. Others have suggested ways that social technologies can be used in a project setting.

In Harrin’s (2010a) professional commentary, she suggests seven tasks where the use of social technologies is relevant, as shown in Table 2.6. The tasks identified by Harrin (2010a) tend to reflect a somewhat traditional view of project management where the focus is on execution. Indeed, as Harrin (2010a, p.16) commented in an address to her audience of project managers:

“It’s likely that your project management function hasn’t moved on at all, and you are still doing the same old stuff you did 10 years ago.”

Table 2.6 The uses of social media tools for project tasks (adapted from Harrin 2010a, p.30)

Project task	Blogs	Shared workspace	Instant Messages	Microblogs	Social Network	Wikis	Newsfeed/Podcast/Vodcast	Online meetings
Career building					•			
Collaboration/Team Working	•	•	•	•				
Knowledge Management	•					•		
Meetings		•						•
Project Log	•					•		
Status Updates			•	•				
Training	•						•	

With the exception of career building and training, the tasks identified by Harrin (2010a) are concerned with project delivery. For the five delivery tasks, Harrin (2010a) considers blogs to be appropriate to three tasks, and shared workspaces, instant messages, microblogs and wikis to be relevant to two. In addition, Harrin (2010a) highlights the potential for:

- blogs to provide a channel for communication with those outside the project team and for obtaining feedback from stakeholders;
- shared workspace to enable team members to work remotely;
- instant messages to provide fast and direct answers to questions.

Social networks she considers to be relevant for career building; blogs, podcasts and vodcasts for training. Harrin's (2010a) suggestions are supported with anecdotal evidence but have not been tested through empirical research.

The role of instant messaging (IM) during meetings was the focus of research by Dennis et al (2010). New interactions, called "backstage conversations" and "invisible whispering" (ibid., p845), are identified, and they suggest such interaction would be "physically impossible or socially constrained without the use of IM" (ibid.). Dennis et al (2010) examine how such interaction

"changes the processes of collaborative decision making and how these new processes may affect the efficiency and effectiveness of collaborative decision making" (ibid.)

Turban et al (2011) proposed a framework for adopting collaboration tools for virtual group decision making. They define group decision making as a collaborative process where:

"two or more individuals, groups or organizations are working together, in order to accomplish a task or attain a goal." (ibid. p139)

Their process has some similarities with a project and they identify four phases – intelligence, design, choice and implementation. The final phase, implementation, is concerned with project delivery. Intelligence gathering, design and choice were not addressed by Harrin (2010a) but are relevant to "front end development and definition" suggested by Morris (2013, p. 118) in the second level of management.

The focus of Turban et al's (2011, p.141) work is "Collaboration 2.0" and they discuss a range of social software corresponding to the seven of the technologies identified for this work. Shared workspace is not within the scope of their work, perhaps because their focus is collaboration rather than document storage.

For the intelligence, design and choice phases, Turban et al (2011) suggest blogs, IM, microblogs, and wikis are relevant. In all four phases, Turban et al (2011) suggest that social networks are relevant, unlike Harrin (2010a), and they highlight features such as polling, voting and discussion groups. Use of a shared workspace for collaboration and meetings, as suggested by Harrin (2010a) is not mentioned by Turban et al (2011). For the final implementation phase, Turban et al (2011) refer specifically to project management and suggest a role for all types of collaborative technology.

Turban et al's (2011) suggestions, like Harrin's (2010a), are derived from anecdotal evidence. They propose a framework for adopting social networking software for group decision making. The framework and issues they discuss are intended to serve as a guide for the adoption of collaboration tools but have not been tested with empirical research.

In contrast, Gimpel et al (2014) investigated perceptions of the relevance and benefits of social collaboration technologies in project work by gathering the perceptions of users. Gimpel et al (2014) identify sixteen items they called "benefits". Using the explanations provided, ten of these are indicative of project activities that are supported by social technologies. For example, the explanation of the benefit "store information" is stated as "improves the possibility to store project relevant information, knowledge or documents" (ibid., p7). The remaining six "benefits" are, for the purposes of this work, regarded as the consequences or impact of using social technologies and will be discussed later (see section 2.8). The ten project activities identified by Gimpel et al (2014), in order of relevance (mean value shown in brackets), are:

- Storing information (4.34)
- Spreading external content in the project team (4.08)
- Coordinating project work (4.01)
- Informal exchange (3.95)
- Integrate external collaborators (3.92)
- Discussion (3.81)
- Identifying expertise (3.65)
- Organizing meetings (3.64)
- Solving problems (3.45)
- Brainstorming (3.39)

(Gimpel et al 2014, p. 10)



Storing information and spreading content can be considered “knowledge management” activities, as identified by Harrin (2010a), and are traditional project management activities. Harrin’s (2010a) three project tasks of collaboration/team working, project log and status updates correspond to Gimpel et al’s (2014) coordinating project work, and are also traditional project management activities. The other seven activities can be viewed as addressing the challenges that were identified in section 2.2. Solving problems and brainstorming recognize that projects tend to emerge rather than being fully planned, and are associated with Turban et al’s (2011) intelligence and design phases. Informal exchange, discussion and organizing meetings recognize the socially constructed nature of a project, and “organizing discussions” was highlighted by Oborn and Dawson (2010, p.843) as a facilitating practice. Integrate external collaborators and identifying expertise recognize a need for communication across the project boundary, and are associated with Turban et al’s (2011) intelligence and design phases.

Suggestions for uses of social media in project settings have been made by the APM (2014). The APM (2014) suggest there are four main uses: discursive, networking, events calendar / task scheduling, and collaboration. Three discursive activities are identified: sharing lessons learnt “amongst the wider project management community” (APM 2014, p. 1), sharing best practice, and stakeholder management. They suggest “major external platforms, such as LinkedIn” (ibid.) are suitable and classified here as social networks. Networking, using external platforms, is highlighted and they suggest social platforms can be used to “source skills and expertise for their projects” (ibid.). Collaborative calendars (e.g. Doodle) are suggested for organising meetings and “organisation platforms such as Trello to organise and manage work streams” (ibid.). Neither collaborative calendars nor organisation platforms are included within the typology used for this research, but the activities are included and the technologies are noted as new developments in social media. Fourthly, APM (2014) suggest a role for collaboration tools, particularly internal wikis. Shared workspaces, such as Google Docs, are also suggested by APM (2014) for controlling project documentation and co-authoring.

Silvius and Silvius (2016) analysed a range of mobile apps for project management. It is not clear which technology types were included in their research but overall they found:

“the functionality of project management apps today is mainly focused on two application areas: (A) Supporting the role of the project manager individually in the planning/organizing processes of the project and (B) Supporting team

communication and team collaboration. Lacking in functionality seems to be the communication/collaboration with project sponsor and other stakeholders.”

(Silvius and Silvius 2016, p.179)

Practical applications of social media on projects are discussed by Van der Merwe (2016) and a range of activities are identified. Specific technologies are not identified by Van der Merwe (2016) but she differentiates between social media tools for use by project team members versus tools to use as a project manager for thought leadership and to deepen networks.

Four categories of activities for social media on projects are suggested by a range of authors:

- Project work
- Project management activities
- Project engagement
- Connecting a project to the environment.

Similar activities have been grouped together and a comparison of the activities suggested by different authors can be seen in Table 2.7.

Table 2.7 Synthesis of literature on use of social media by activity

	Blogs	Shared workspace	Instant Messages	Microblogs	Social Network	Wikis	Newsfeed/Podcast/Vodcast	Online meetings	Events calendar/task scheduling tools
<b>Project work</b>									
Team work and collaboration (Harrin 2010a)	●	●	●	●					
Supporting team communication and collaboration (Silvius & Silvius 2016)									
Integrate external collaborators (Gimpel et al 2014)	●	s	s	●	●	●	●		
Implementation e.g. report writing (Turban et al 2011)	●		●	●	●	●	●	●	
Document control & co-authoring (APM 2014)		●							
Storing information (Gimpel et al 2014)	●	s	●	●	●	s	●		
Spreading external content in the project team (Gimpel et al 2014)	●	s	●	●	●	s	●		
Knowledge management (Harrin 2010a)	●					●			
<b>Project management activities</b>									
Coordinating project work (Gimpel et al 2014)	●	s	s	●	●	●	●		
Planning and organising (Silvius & Silvius 2016)									●
Manage work streams (APM 2014)									
Project log (Harrin 2010a)	●					●			
Status updates (Harrin 2010a)			●	●					
Decision making (Turban et al 2011)	●		●	●	●	●			
Thought leadership (Van der Merwe 2016)									
<b>Engagement activities</b>									
Organising meetings (Gimpel et al 2014)	●	s	s	●	●	●	●		
Organise meetings (APM 2014)									●
Meetings (Harrin 2010a)		●						●	
Meetings (Dennis et al 2010)			●						
Informal exchange (Gimpel et al 2014)	●	s	s	●	●	●	●		
Ad-hoc information sharing (Van der Merwe 2016)									
Share stories, ask questions (Van der Merwe 2016)									
Discussion & solving problems (Gimpel et al 2014)	●	s	s	●	●	●	●		
Discuss challenges with other PMs (Van der Merwe 2016)									
Brainstorming (Gimpel et al 2014)	●	s	●	●	●	s	●		
<b>Communication across project boundary</b>									
Stakeholder management (APM 2014)									
Relationship building (Van der Merwe 2016)									
Sharing lessons learnt & best practice (APM 2014)					●				
Best practices (Van der Merwe 2016)									
Identifying expertise (Gimpel et al 2014)	●	s	●	●	s	●	●		
Sourcing external expertise (APM 2014)					●				
Communication beyond team (Harrin 2010a)	●				●				
Research information (Van der Merwe 2016)									

s denotes highest or second highest performing technology (Gimpel et al 2014)

● denotes use of a specific technology, where specified

Some suggestions for uses of specific technologies are made, as shown in Table 2.7 although how the technologies perform is not assessed by Harrin (2010a) or Turban et al (2011). In contrast, Gimpel et al (2014) assessed the performance of seven social technologies in project work, and their findings are discussed next.

### **Performance of social technologies in project activities**

Gimpel et al (2014) evaluated the performance of seven individual technologies in terms of benefits. They ranked the performance of social collaboration technologies in supporting project work, expressed as a percentage share of benefits, as follows (they did not include online meetings):

- Shared workspace (50.7%)
- Instant messenger (22.5%)
- Wiki (15.6%)
- Social network (11.2%)
- Newsfeed (9.3%)
- Blog (7.6%)
- Micro-blog (5.3%).

(Gimpel et al 2014).

Gimpel et al (2014) also present their results by activity and these results are shown in Table 2.8 Gimpel et al (2014) found that shared workspace provided the most support for knowledge management activities, although a role for shared workspace in knowledge management was not identified by Harrin (2010a). The highest performing technologies for coordinating project work were shared workspace and instant messaging, consistent with Harrin's (2010a) suggestions. Gimpel et al's (2014) results suggest there is a role for all of the six technology types in coordinating project work, with microblogs scoring lowest, and this is consistent with Turban et al's (2011) suggestions for their implementation phase (with the exception of the technologies that were out of scope for the respective works). No performance data has been uncovered for online meeting software or events calendar/task scheduling tools.

Overall, six social technologies are suggested to provide strong support for project work – blogs, shared workspace, instant messages, microblogs, social networks and wikis. Less potential for support is suggested from newsfeed/podcast/vodcast technology, and online meetings are considered to be relevant only in terms of project participation.

Table 2.8 Performance of social collaboration technologies by activity (share of total scores per benefit in %; n=212. Adapted from Gimpel et al (2014, p. 14))

Project activity	Blogs	Shared workspace	Instant Messages	Microblogs	Social Network	Wikis	Newsfeed/Podcast/Vodcast
Storing information	3	59	2	1	2	27	6
Spreading external content in the project team	10	42	3	5	7	18	15
Coordinating project work	4	51	21	2	4	10	8
Informal exchange	7	27	34	10	11	6	5
Integrate external collaborators	4	48	19	1	12	11	6
Discussion	11	24	32	10	14	7	2
Identifying expertise	5	27	13	4	26	20	4
Organizing meetings	2	45	30	1	9	6	7
Solving problems	7	34	26	5	8	16	4
Brainstorming	10	32	13	8	14	18	5

Key

	Highest performing technology for activity
	Second highest performing technology for activity

The activities identified for social media identified in Table 2.7 are now compared with the activities suggested in the re-conceptualisation of communication on projects in three zones (as illustrated in Fig. 2.8).

### Comparison of project activities

Comparison between the two sets of activities reveals gaps and common activities. Some of the suggestions made for deployment of social media increase understanding of activities in the three zones.

The zone of participation is correlated with the project work activities and the management activities. Of the three activities in the zone of participation, two activities are also found in suggestions for use of social media. Three suggestions for social media add to an understanding of coordinating and integrating work; and four add to

understanding of planning and control. Feedback and learning (Daft and Weick 1984, Augustine 2005) is missing from the literature on social media in projects.

The zone of engagement is mapped to the engagement activities. Engaging, aligning and imagining (Wenger 2000) is correlated with two types of activity suggested for social media: meetings and informal exchange. Organising discussions (Oborn and Dawson 2010) correlates with organising meetings. Acknowledging other perspectives (Oborn and Dawson 2010) correlates with discussion and solving problems. Challenging assumptions (Oborn and Dawson 2010) is considered similar to brainstorming. Gathering feedback (Cadle and Yeates 2008, Daft and Weick 1984) is missing.

The zone of connectivity is related to the activities for communication across the project boundary. Of the six activities identified in the zone of connectivity, four are related to the activities suggested for social media in projects. Connecting the project to business-as-usual processes is reflected suggestions for social media and two discrete activities are identified. Two influencing activities are not suggested for social media: surfacing resistance (Cadle and Yeates 2008) and adapting to change (APM 2012, Cadle and Yeates 2008). Communication beyond the project boundary (Harrin 2010a) may include sharing the project vision (Müller and Turner 2010) but is not explicitly stated. Similarly, the suggestion of research made by Van der Merwe (2016) does not explicitly reference scanning.

As a result of the comparison, the most appropriate term was selected for each of the activities. A summary of the comparisons is shown in Table 2.9, and the terms chosen for each activity are shown in bold.

Participation in project is emphasised in literature and reflects a conventional approach to managing projects. Van der Merwe (2016), Harrin (2011a) and others suggest social media can be deployed to improve project communication and collaboration. There is some evidence of this happening from practice although, with the exception of Gimpel et al (2014), research to date lacks academic rigour. Hence, all the activities identified are included in the conceptual framework, as shown in Fig. 2.15. All the activities identified in bold in Table 2.9 are included in Fig. 2.15. Thus, Fig. 2.15 provides a summary of how the third research question, about what behaviours are involved in using social media to manage projects, has been addressed by previous work.

Table 2.9 Comparison of project management activities

	<b>Communication activities</b> (from Fig. 2.8)	<b>Social media in project management</b> (from Table 2.7)	
<b>Participation</b>	Coordinating & integrating (e.g. PMI 2013)	<b>Team work and collaboration</b> (Harrin 2010a) Supporting team communication (Silvius & Silvius 2016) Integrate external collaborators (Gimpel et al 2014)	<b>Project work</b>
		<b>Document control &amp; co-authoring</b> (APM 2014) Implementation & report writing (Turban et al 2011)	
		<b>Storing information</b> (Gimpel et al 2014) <b>Knowledge management</b> (Harrin 2010a) Spreading external content in the project team (Gimpel et al 2014)	
	<b>Feedback &amp; learning</b> (e.g. Daft & Weick 1984, Augustine 2005)	[not found]	
<b>Participation</b>	Planning & controlling (e.g. Morris 2013)	Coordinating project work (Gimpel et al 2014) <b>Planning and organising</b> (Silvius & Silvius 2016)	<b>Management</b>
		<b>Project log</b> (Harrin 2010a)	
		<b>Status updates</b> (Harrin 2010a)	
		<b>Decision making</b> (Turban et al 2011) <b>Thought leadership</b> (Van der Merwe 2016)	
<b>Engagement</b>	Engaging, aligning & imagining (Wenger 2000)	<b>Meetings</b> (Harrin 2010a, Dennis et al 2010)	<b>Engagement</b>
		<b>Informal exchange</b> (Gimpel et al 2014) Ad-hoc information sharing (Van der Merwe 2016) Sharing stories, ask questions (Van der Merwe 2016)	
	Organising discussions (Oborn & Dawson 2010)	<b>Organizing meetings</b> (Gimpel et al 2014)	
	Acknowledging other perspectives (Oborn and Dawson 2010)	<b>Discussion &amp; solving problems</b> (Gimpel et al 2014) Discuss challenges with other PMs (Van der Merwe 2016)	
	<b>Challenging assumptions</b> (Oborn & Dawson 2010)	<b>Brainstorming</b> (Gimpel et al 2014)	
<b>Gathering feedback</b> (Daft & Weick 1984, Cadle & Yeates 2008)	[not found]		
<b>Connectivity</b>	Connecting project to business as usual processes (e.g. APM 2012)	<b>Stakeholder management</b> (APM 2014) Relationship building (Van der Merwe 2016)	<b>Communication across boundary</b>
		<b>Sourcing external expertise</b> (APM 2014, Gimpel et al 2014) Identifying expertise (Gimpel et al 2014)	
	<b>Gathering feedback</b> (Cadle & Yeates 2008)	<b>Sharing lessons learnt &amp; best practices</b> (Van der Merwe 2016, APM 2014)	
	<b>Surfacing resistance</b> (Cadle & Yeates 2008)	[not found]	
	<b>Adapting to change</b> (Cadle & Yeates 2008, APM 2012)	[not found]	
	<b>Sharing vision</b> (Müller & Turner 2010)	Communication beyond project team (Harrin 2010a)	
<b>Scanning</b> (Daft & Weick 1984)	Research information (Van der Merwe 2016)		

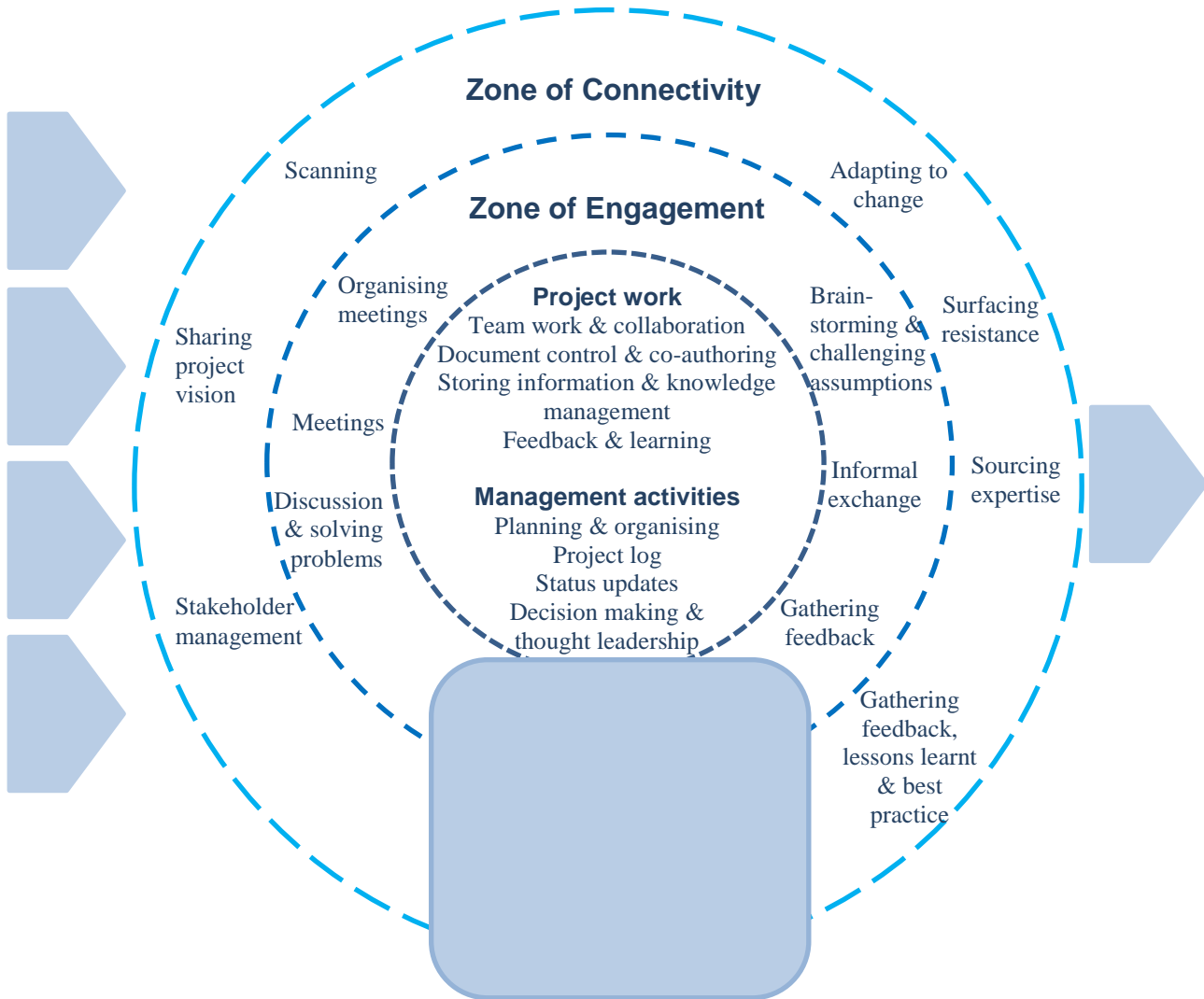


Fig 2.15 Activities for deployments of social media in three zones



## 2.8 Impacts of using social technologies in projects

The review now turns to the fourth objective and to discuss previous work on the perceptions of the impacts, consequences and concerns of using social media in project settings.

Empirical research and understanding of the impact of social media on projects, project success and project management practices are limited (e.g. Remidez and Jones 2012). In this section, the impacts and consequences that have been identified for use of social media are discussed. Both benefits and concerns are explored.

In their survey of business executives, Bughin et al (2011) asked about benefits of Web 2.0 applications in three categories – internal purposes; customer purposes and partners; suppliers and external-expert purposes. Customer purpose benefits (marketing effectiveness, customer satisfaction and reduced marketing costs) may not be relevant to all types of projects, but the benefits identified in the other categories are more relevant for this work, and these were:

- Increasing speed to access knowledge
- Reducing communication costs
- Increasing speed to access internal/external experts.

(Bughin et al 2011)

Remidez and Jones (2012) suggested efficiency and trust as potential benefits of using social media, as well as facilitating access to tacit knowledge exchange and spanning the project boundary, however they did not test these suggestions with research.

In contrast, Elie-Dit-Cosaque and Pallud (2012) researched the post adoptive outcomes of using collaborative technologies and found that system usage and satisfaction were positively correlated with collaborative performance. Their research showed that collaborative performance, through trust, and the affective reaction called “flow” (ibid. p.3), were positively correlated with creativity. **Creativity** is important where a project is considered to be a complex social system, as illustrated by the definition used by Elie-Dit-Cosaque and Pallud (2012, p.3):

“the creation of a valuable, useful new product, service, idea, procedure or process by individuals working together in a complex social system”.

Gimpel et al (2014) identified sixteen “benefits” of using social technologies in project work. Ten of these have already been discussed, and are considered to indicate the project activities where the technologies are relevant, while the other six are

considered to represent impact. The six benefits or outcomes identified by Gimpel et al (2014) are **efficiency, productivity, flexibility, transparency, motivation and trust**. Explanations of the benefits are provided by Gimpel et al (2014) but the definitions are limited e.g. motivation is defined as “increases the motivation in the team” (ibid., p.7).

The performance of social technologies relevant to the benefits is assessed by Gimpel et al (2014) and their results are shown in Table 2.10. Overall, shared workspace and instant messages are perceived to contribute the greatest to the six benefits, although newsfeed was scored second highest for transparency and trust. No drawbacks or negative consequences of using social technologies are suggested by Gimpel et al’s (2014) work.

Table 2.10. Performance of social collaboration technologies by benefit (share of total scores per benefit in %; n=212) (Adapted from Gimpel et al (2014, p. 14))

Benefit	Blogs	Shared workspace	Instant Messages	Microblogs	Social Network	Wikis	Newsfeed/Podcast/Vodcast
Efficiency	3	51	21	3	3	12	7
Productivity	3	53	21	3	2	12	6
Flexibility	4	45	28	4	4	9	4
Transparency	14	45	4	3	4	12	18
Motivation	7	27	19	9	18	7	13
Trust	8	45	11	3	11	9	13

Key

	Highest performing technology for benefit
	Second highest performing technology for benefit

Others have made suggestions about the impacts of social media on projects but these have not been quantified. Harrin (2010a) provides anecdotal evidence that suggests impacts can include efficiency, productivity and flexibility, corresponding to three of the benefits identified by Gimpel et al (2014). Harrin’s (2011b) survey identified efficiency benefits in the form of improved communication.

Dennis et al (2010) suggest “invisible whispering” may affect

“the efficiency and effectiveness of collaborative decision making as well as participation, satisfaction, relationships among team members and individual attention.” (ibid., p845)

Van der Merwe (2016) suggests the benefits are quick, ad-hoc information sharing, flexibility by providing information from any location, **quality** by fostering continuous improvement, builds trust and morale. Van der Merwe (2016) also highlighted a concern about the potential for **information overload**.

Synthesis of the impacts suggested by previous work has been used to address the fourth research objective, and eight benefits and one concern are added to the conceptual framework, as shown in Fig. 2.16.

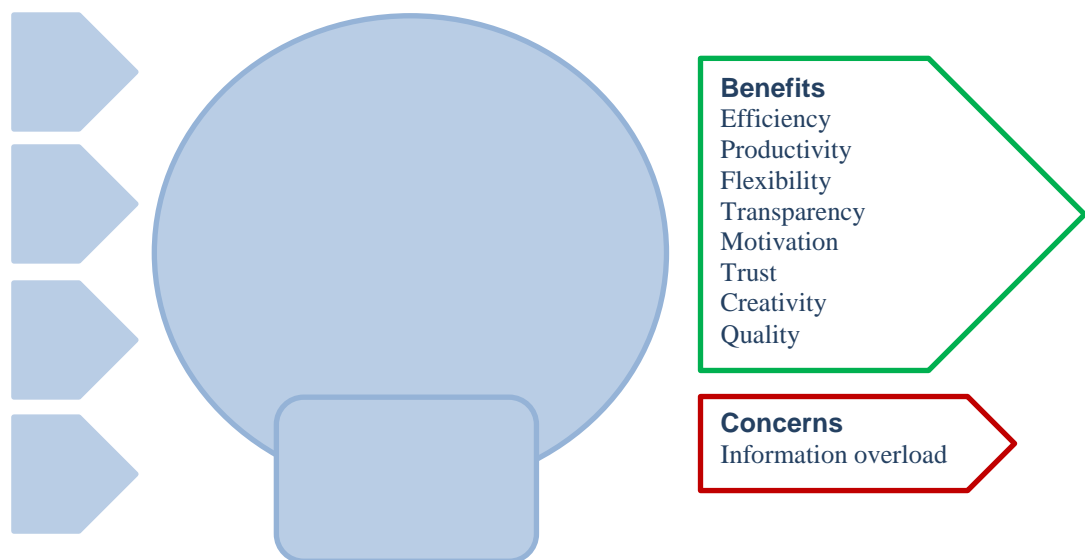


Fig 2.16 Benefits and concerns of using social media in project settings

This review now concludes by summarising the literature on project management, social media and social media in projects. The contributions of previous work to all four research objectives are synthesised and shown within the overall conceptual framework.

## 2.9 Summary of conceptual framework

Project management theory and practice are evolving at the same time as rapid developments in social media and mobile technologies. This work takes a socio-technical perspective to examine the intersection of project management with social media.

In the field of project management, a largely deterministic perspective remains dominant despite criticism that highlights the socially constructed nature of projects. This work focusses on communication as a key component of managing projects, and three zones of communication are conceptualised.

The ubiquity of social media and mobile technologies, it is argued, has created a hyper-connected world that enables entirely new ways of working. Further, digital natives think and process information fundamentally differently from earlier generations. Research on use of social media in project settings is limited and tends to be influenced by traditional, deterministic perspectives.

The theoretical framework for this research incorporates nine types of social media. Factors influencing the use of social media in project settings are derived from a synthesis of sources, including from the mature field of technology adoption. Influencing factors are grouped into four categories.

Behaviours have been discussed and suggestions made for the deployment of social media in project settings have been explored. Activities suggested for social media have been compared with the activities in the three zones of communication. Eight activities are identified in the zone of participation, incorporating project work activities and management activities. Six activities are classified within the zone of engagement. The technology types suggested to be most relevant are similar for project participation and engagement, namely shared workspace, instant messaging and wikis (Gimpel et al 2014). Seven activities are identified in the zone of engagement, and the most relevant technologies identified are shared workspaces and social networks (Gimpel et al 2014). In total, twenty-one activities are included in the conceptual framework, and Gimpel et al (2014) found the most relevant technologies to be shared workspaces, instant messaging and wikis.

Impacts of using social media in an enterprise setting, as distinct from personal use, have been explored. Eight benefits and one concern have been identified. The research by Gimpel et al (2014) suggests shared workspace, instant messaging and

technologies of the newsfeed/podcast/vodcast type make the greatest contribution to project work. Overall, the debate amongst practitioners about whether the impact of using social technologies in projects is beneficial or detrimental continues.

The aim of this work is to investigate how social media interacts with the practice of project management. To date, practical and theoretical advances have largely been independent of one another (Florice et al 2014). Academic research to date on the use of social media in project settings has two significant limitations. First, the scope for research has been limited because use of social media in project settings is a relatively new phenomenon. Second, research on projects and project management is shaped by a largely traditional notion of project management. Accordingly, this work uses contemporary lived experiences of project managers and project management has been re-conceptualised.

A conceptual framework has been developed as a starting point for bringing together social media and project management in a way that enables exploration of new practices and avoids giving precedence to either aspect. Although unusual for qualitative research, the conceptual framework provides a foundation for comparisons between existing literature and new data. The conceptual framework is shown in full diagrammatically in Fig. 2.17, and a duplicate diagram is provided for convenience in Appendix A.

In the next chapter, the way this work responds to the calls for research on what practitioners actually do when managing projects (e.g. Blomquist et al 2010), and uncovers how social media are used, is presented. Understandings of social media practices suggest that project managers of the future will think and process information differently from previous generations. Hence, it is argued here, research is required on how practitioners, whose experience of social media pre-dates their formal experience of project management, use social media in managing projects.

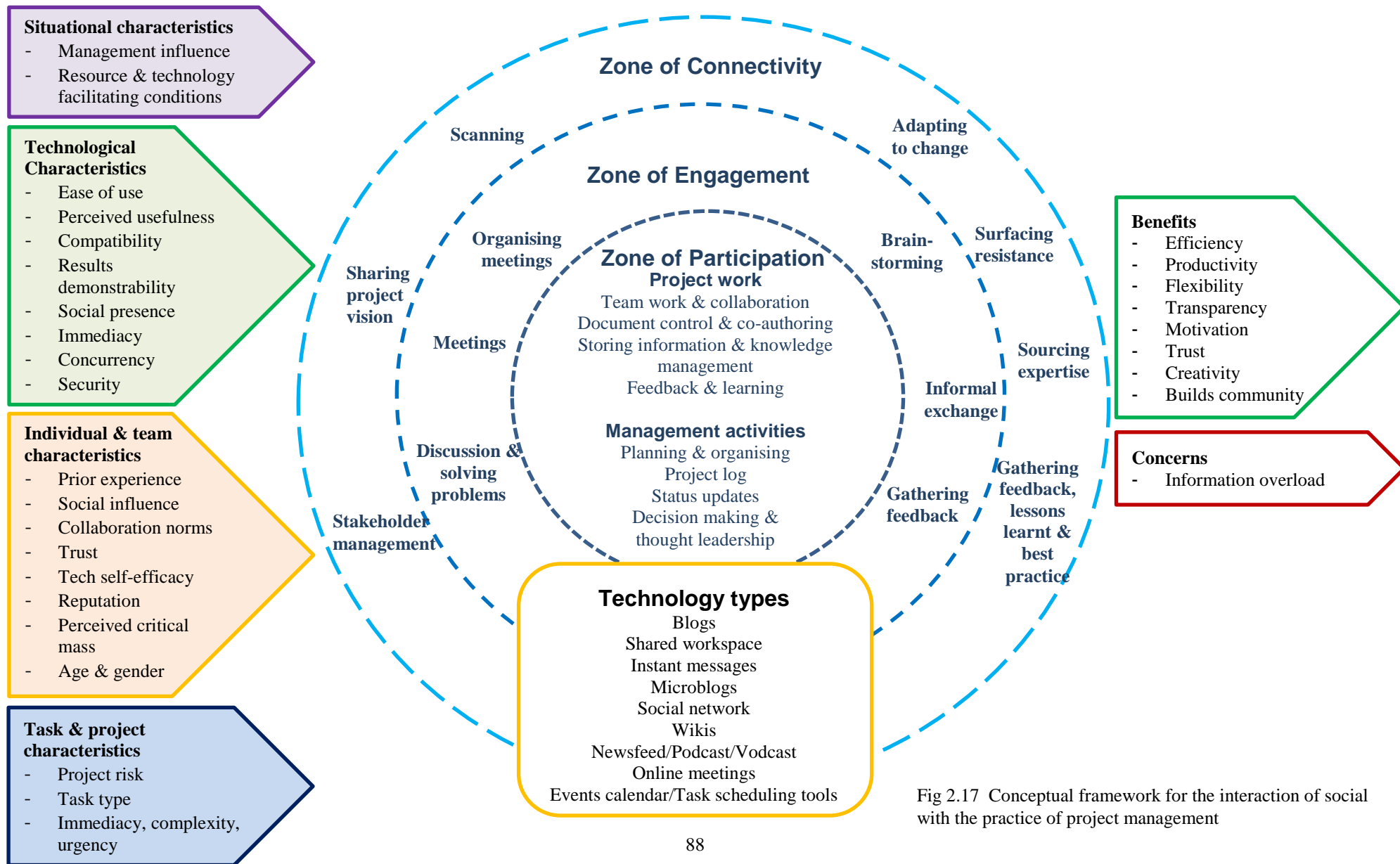


Fig 2.17 Conceptual framework for the interaction of social with the practice of project management

### **3 Research Methodology**

#### **3.1 Introduction and structure of this chapter**

Developing the conceptual framework for this research involved importing theory from disciplines outside the field of project management. Accordingly, designing research to pursue the central question – how do social media interact with the practice of project management? - was not straightforward. This chapter sets out the design requirements and constraints, the choices considered, and explains how the requirements were met. In this way, the research design is explained and justified.

One important requirement was to hear from practitioners whose experiences of social media pre-date their formal experience of project management, and whose practices may be novel. Therefore, an abductive strategy was pivotal to pursuing this research. The abductive strategy was combined with a pragmatic approach to data collection, and data analysis using recursive abstraction. In this way, new constructs were developed, refined and validated.

Researchers in the field of project management face many challenges. The chapter begins by discussing the issues that are relevant to the theoretical grounding of this work (section 3.2). Section 3.3 addresses the philosophical nature of reality and knowledge to explain the choices made that are relevant to the research design. Sections 3.4 and 3.5 are concerned with conceptual reasoning, and use of abductive strategy is explained and justified. The choice of a qualitative approach is discussed in detail in section 3.6. In section 3.7, implementation is explained, including how the field site was selected, and why purposive sampling with self-selection was used. Ethical considerations are addressed in section 3.8. In the final section (3.9), the way data was generated and analysed from a series of non-directive interviews is explained. A summary of the methodological choices made is shown in Fig. 3.1.

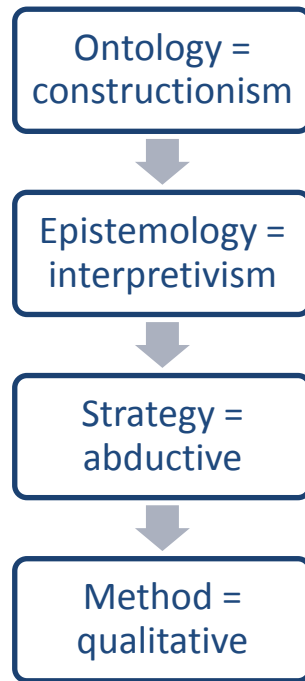


Fig 3.1 Summary of methodological choices

### 3.2 Research on projects: the gap between theory and practice

Project management researchers face an array of challenges. Not least, for many years project management research has not had a recognised basis and the relevance of research to modern practice is limited (e.g. Maylor and Söderlund 2015). Practical and theoretical drivers in project management have tended to generate advances that are largely independent of one another (Florice et al 2014). Evidence from a preeminent research conference in the field – IRNOP 2013 – suggests that while these new perspectives are seen as contributing to “the needed pluralism in project management research” (Müller and Söderlund 2015, p.251), to date they have not been “matched by a related variety in empirical research designs and research method” (ibid.)

There is a long tradition of system-based, largely quantitative research that has been aimed at identifying best practice, guidelines and forecasting, and some of the results are seen in textbooks and various bodies of knowledge. Limitations of such research have been highlighted and widely discussed (e.g. Hodgson & Cicmil 2006, Cicmil et al 2006, Ika 2009, Blomquist et al 2010), for example:

“a unified theory of the management of projects does not exist. Projects are context-specific and located in open-systems. While this is now widely



acknowledged, research methodologies often continue to overlook this.” (Smyth and Morris 2007, p.423)

More recently, a process-orientated perspective borrowed from the social sciences has been used in what has been called a “project-as-practice” (Blomquist et al 2010, p.5) approach. Reflecting calls to “takes seriously practitioner’s lived experience of projects” (Cicmil et al 2006, p.675), project-as-practice research views projects as “social and organized settings on which numerous conceptual organizational theories and organizational behaviour frameworks can be applied and developed” (Blomquist et al 2010, p.6).

Process studies have contributed to an understanding of projects as social processes but have limitations. Blomquist et al (2010) argue that process studies focus on projects as defined by organisational structures and on people in charge sacrifices “a bottom-up analysis of what individual actors actually do when they work on projects” (Blomquist et al 2010, p.7). In addition, there have been calls to improve project management research by importing established theoretical approaches from other disciplines (Maylor and Söderlund 2015). The challenge for project management research can be viewed as a jigsaw puzzle, where research has the potential to bridge the gap between theory and practice, as illustrated in Fig. 3.2.

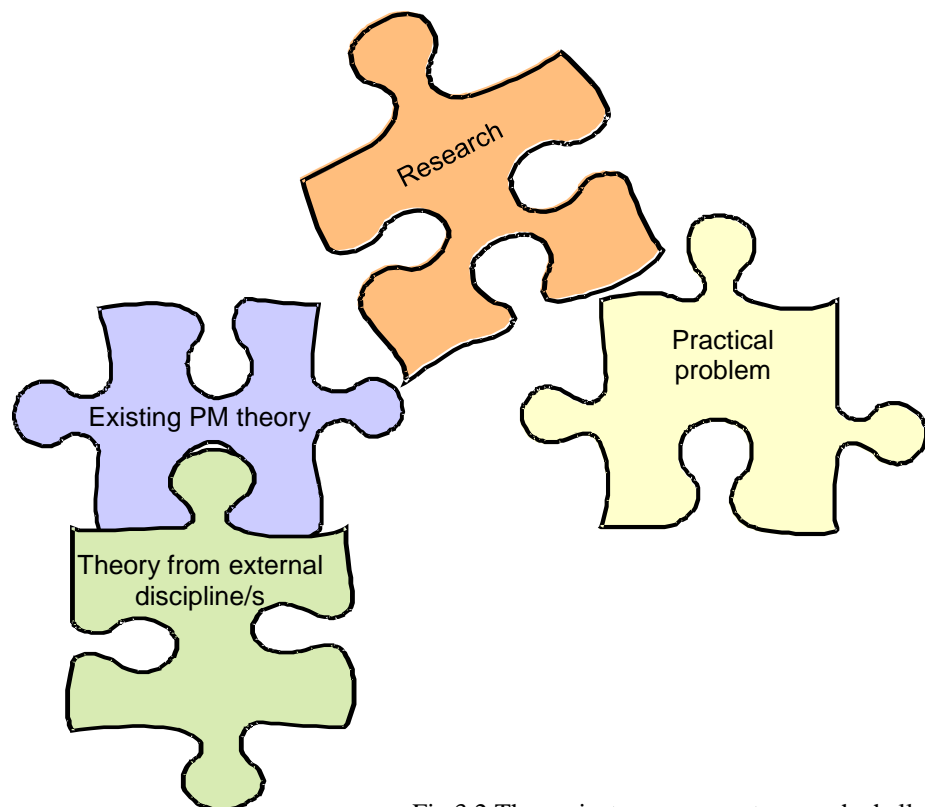


Fig 3.2 The project management research challenge (adapted from Lehtiranta et al 2016)

The project management research challenge is the background for this work. The practical problem is to develop an understanding of what happens when social technologies are deployed in a project management context. External theory from the fields of organisational learning and knowledge management has been used to provide new perspectives on projects. In order to bridge the gap between theory and practice, this research follows Bredillet (2016, p.43) in using “an emancipatory methodology for praxeological inquiry”, as explained:

“The place of projects in global economy, the consequences of uncertainty and complexity of the environment, the failure of rationalist project approaches to deliver expected benefits, both with regards to Practice and Theory, lead us to consider a praxeological style of reasoning balancing both modernism and post (or pre)-modernism approaches and the so-called kaleidoscopic and pluralistic perspectives.” (Bredillet 2016, p.43)

The specific choices for the approach are discussed in the following sections, beginning with the assumptions about reality (ontology) and knowledge (epistemology).

### 3.3 Reality and knowledge

A distinction has been made between the questions “What is a project?” and “What do we do when we call something a ‘project’?” (Hodgson and Cicmil 2007, p.432). The first question refers to the ontology of ‘being’ and is related to the traditional objectivist paradigm, while, the second question concerns ‘becoming’ and is related to projects as shaped by human interactions (Bredillet 2016); the ontological position of constructionism. Traditionally, objectivism and constructionism are considered incommensurable. However, to bridge the theory-practice gap, Bredillet (2016, p.47) suggests “an alternative style of reasoning embracing the continuum of ontological perspectives”, as he explains:

“The reason is that [project] actors, practices and their contexts are located in a physical world and involve, therefore, a certain degree of materiality. But in the meantime, the physical world is informed and transformed by the choice, deliberations, values and policies of actors...” (Bredillet 2016, p. 47)

Following Bredillet (2016), this work recognises a range of realities from the material to the subjective: the definition of a project used here incorporates both material and subjective aspects. In a similar way, social technologies are located in both a physical and subjective world, as illustrated in Fig. 3.3. However, the focus of this work is understanding human behaviour. Therefore, while acknowledging different realities of projects and social technologies, this research is orientated towards an ontological position of constructionism.

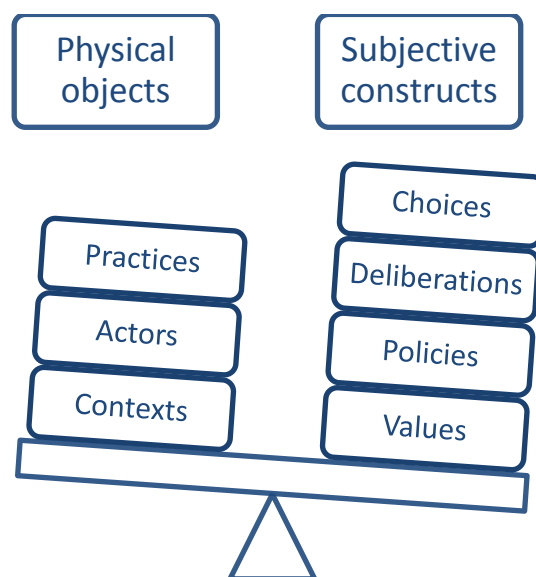


Fig 3.3 Realities of projects and social media

“Constructionism is an ontological position ... that asserts that social phenomena and their meanings are continually being accomplished by social actors.” (Bryman and Bell 2003, p.20)

From this perspective, social objects and categories are viewed as socially constructed and research from this position emphasises the active participation of people in reality construction (Bryman and Bell 2003, Klakegg 2016). Constructionism is therefore an appropriate response to a requirement for “a critical dialogue with the practitioner who reflects and interprets their own experience” (Cicmil et al 2006, p.677). A corollary to such a view of reality is the need for a “bottom up” approach aimed at understanding practice (Blomquist et al 2010, p.8).

Emphasis on the active participation of people in reality construction can be seen as a limitation of research using a constructionist philosophy. Constructionism plays down the formal dimensions of an organisation (Klakegg 2016) and acknowledges many different and co-existing views of reality. This work does not seek one definitive, verifiable view of reality. The limitation of constructionism in presenting a specific version of social reality is recognised and is appropriate for this work.

From a position on the nature of reality of constructionism, the philosophical position on knowledge (epistemology) is that of interpretivism. Interpretivism is based on the assumption that the social sciences are different from the natural sciences. Projects are complex human situations and therefore require logic that “reflects the distinctiveness of humans as against the natural order” (Bryman and Bell 2003, p15). The assumption is explained as follows:

“The fundamental difference resides in the fact that social reality has meaning for humans and therefore human action is meaningful – that is, it has a meaning for them and they act on the basis of the meanings that they attribute to their acts and to the acts of others.” (Bryman and Bell 2003, p17)

One alternative that was considered is critical realism, as suggested by Cicmil and Hodgson (2006). However, it has been argued that a critical approach can be seen as operating in parallel to other approaches and “is applicable as a critical assessment of research and practice in general” (Blomquist et al 2010, p.8), and this is the view taken here.

It has also been noted that there is some confusion amongst authors regarding ontology and epistemology. For example, the notion of constructionism is used in relation to both reality and knowledge. In terms of reality, Blaikie (2007) defines an idealist view, but there seems to be little to differentiate this from constructionism. The idealist view, he explains, is where social reality is considered to consist of:

“the shared interpretations that social actors produce and reproduce as they go about their everyday lives” (Blaikie 2007, p.17).

Blaikie (2007) goes on to explain the status of knowledge most closely associated with an idealist ontology is the epistemology of constructionism, where knowledge is considered to be:

“the outcome of people having to make sense of their encounters with the physical and with other people” Blaikie (2007, p.22).

Notwithstanding such confusion, the foundation of this work is the ontology of constructionism and the epistemological position of interpretivism, as defined by Bryman and Bell (2003).

### 3.4 Knowledge and theory

Traditionally, research uses either deductive logic, where theory comes first, or inductive logic, where theory comes last. This research is anchored in the field of project management and here there is little theory to build on, as Blomquist et al (2010) commented:

“Research on projects is not only an immature field of research, but it is also insubstantial when it comes to understanding what occurs in projects.” (Blomquist et al 2010, p.5)

Bredillet (2016), paraphrasing others, said of project management research:

“... those who expect a “social-scientific Newton” to revolutionize this young field “are not only waiting for a train that will not arrive, but are in the wrong station altogether”” (Bredillet 2016, p. 44-45, original spelling).

Specifically this work is concerned with social media and here too theory is limited. Deductive research uses observations and findings to scrutinise theory. Hence, without substantive theory to begin with, purely deductive reasoning is considered inappropriate for this research.

Inductive logic proceeds from a particular situation, using empirical findings to develop theory with wider applicability. However, the assumption that theory can come last seems naïve, as suggested by Mason (2002):

“The idea that theory can ever come last has been much criticized, since in its most naïve form this appears to assume that research can be begun and undertaken in a theoretical vacuum.” (Mason 2002, p.181, original spelling)

Mason (2002) argues that, in practice and whether or not this is explicitly recognised, researchers often move back and forth between data, experience and concepts, using what is called an abductive research strategy. The notion of moving between data and theory can also be seen in the constructive research that Lehtiranta et al (2016) recommend for bridging the gap between practice and theory: problem solving for complex projects. Echoing these ideas, Bredillet (2016) citing others, notes that improvisation and bricolage are inherent in research.

Abductive research is advocated by Blaikie (2007, p.88-89) as “the appropriate method of theory construction in interpretive social science”. Furthermore, Saunders et al (2012) suggest such an approach “matches what many business and management researchers actually do” (ibid., p.147). Hence, an abductive strategy is adopted for this work.

### 3.5 Abductive research strategy

Mason (2002) defines an abductive research strategy as:

“the process of moving between everyday concepts and meanings, lay accounts, and social science explanations.”(ibid., p180)

An abductive approach combines deduction and induction by moving back and forth from theory to data (as in deduction) and data to theory (as in induction), as suggested by Suddaby (2006). Similarly, in constructive research as described by Lehtiranta et al (2016), deductive reasoning is used to obtain pre-understanding and design constructs. Inductive reasoning is then used to demonstrate feasibility, make theoretical connections and examine the generalisability of the results.

Much of the exiting project management literature is written from the rational, positivistic perspective of “What is a project?”. In contrast, this research sought to understand the situation from the perspective of “What do we do when we call something a ‘project’?” (Hodgson and Cicmil 2007, p.432). Therefore starting the research with pre-understanding derived from pre-existing concepts was rejected.

Other versions of abductive strategy, involve using inductive reasoning to generate concepts, followed by deduction to develop understanding of the problem. Blaikie (2007) describes abductive strategy as:

“constructing theories that are derived from social actors’ language, meanings and accounts in the context of everyday activities [and] begins by describing these activities and meanings, and then derives from them categories and concepts that can form the basis of an understanding or an explanation of the problem at hand” (Blaikie 2007, p.89-90).

Saunders et al (2012, p.147) suggest abduction begins with observation of a “surprising fact” and then proceeds to develop “plausible theory of how this could have occurred.” The amount of information in different contexts is considered important by Saunders et al (2012, p147-8), who suggest abduction is appropriate:

“where there is a wealth of information in one context but far less in the context in which you are researching ...enabling you to modify an existing theory.”

Therefore Saunders et al’s (2012) definition of an abductive approach is adopted for this work:

“the collection of data to explore a phenomenon, identify themes and explain patterns, to generate a new or modify an existing theory which is subsequently tested.” (ibid., p.665)

### 3.6 Qualitative research method

This research is an exploratory study of a new phenomenon requiring insights into real life situations and practitioner behaviours. Two key issues underpin the work. First, this research takes a perspective based on a re-conceptualisation of project management. Such a perspective contrasts with the foundations of practice that is prevalent in many industries today and, it is suggested:

“it is plausible that in the project world we have failed to evolve our constructions and expectations”. (Dalcher 2016a, p.804)

Second, it is suggested that social media practices of the generation now entering the workplace for the first time differ from the practices of previous generations (Prensky 2001). The impact of these issues on the research phenomenon is not yet clearly understood. Hence, a detailed and quantitative method is premature (Angrosino 2007) and qualitative research was required.

Ethnography is “the art and science of describing a group” (Angrosino, 2007, p.16) and ethnographic researchers:

“collect data about the lived human experience in order to discern *predictable patterns* rather than to describe every conceivable instance of interaction or production.” (Angrosino 2007, p.16 original italics)

Although ethnography is particularly suited to situations where theory has yet to be developed, the researcher is typically “a subjective *participant* in the lives of those under study” (Angrosino, 2007, p.16 original italics). For this work, researcher participation within a project team would be inherently problematic, not least due to the pressure to deliver results within a specified timeframe. Negotiating entry to a project team within an organisation the researcher was not familiar with was likely to involve diverting some of the project resources to develop the researcher’s understanding of the context and project activities, with no clear benefit to the project. Following Angrosino’s (2007, p.28) suggestion for a “candid assessment of yourself”, direct participation by the researcher was also rejected because the researcher is not within the demographic required for this research and the bias introduced would be difficult to control.

Observation as a means of collecting data for this research was rejected because perceptions and meanings are not visible and therefore could not be uncovered by observation. To overcome this limitation, the research would have needed to engage



with participants in a project setting and the issues would be similar to those making ethnography unsuitable.

The unit of study suggested by the notion of “project-as-practice” (Blomquist et al 2010, p.5) is a project. However, a project does not have a voice. A way of uncovering behaviour amongst those involved in a project was required for this work. Hence, a series of interviews with young project practitioners was the primary method chosen for this research.

Interviews are widely considered an effective method of interrogation from a practitioner perspective. There are various forms of interview: from highly standardised and researcher-driven interviews that yield primarily quantitative data, through to non-directive, unstructured approaches. Unstructured approaches are considered optimal for an exploratory study, as explained by Shepherd (2015, p.189):

“For an exploratory study, where the aim is to discover ‘what is happening: to seek new insights’ [ref: Robson, 2002, p.59], unstructured interviews are likely to be best suited to the nature of the research because the approach requires a less directive style in order to obtain a wide-ranging view of the issue in question.”

Unstructured interviews can either be guided by an agenda set by the interviewer, or can allow the respondent “to talk freely about the area of interest” (Shepherd, 2015, p.187). This work is concerned with a new phenomenon and therefore the least guided approach, what Shepherd (2015) calls non-directive or informant interviews, was chosen as the primary method for generating data.

### **Non-directive interviews**

A series of non-directive interviews were used to access the lived experience of practitioners and generate data about social behaviour for this research. Social behaviour is “not simply a function of some combination of individual acts” (Tindale et al 2002, p.3). Shared meaning is considered to be “an integral component for understanding social behaviour” (Tindale et al 2002, p.3). For this work, shared meaning is relevant in respect of two groupings:

- shared meanings in respect of a project; and
- shared meanings around use of social media amongst a young generation.

Understanding the behaviours of project practitioners around social media involved uncovering shared meanings, particularly amongst team members. Hence, non-directive team interview was the preferred method for generating data.

Non-directive interviews were used in order to uncover a range of perspectives on use of social media for managing projects. Use of inductive reasoning implied it was not appropriate for the researcher to guide the interview, and consistency was assured by the same person – the researcher – conducting all interviews.

### 3.7 Implementation

This section articulates how the research design was implemented and the systematic programme of data collection and analysis is explained. The time frame for three stages of data collection is presented (Table 3.1). The rationale for the choice of a field site is discussed and the pragmatic steps taken to recruit participants are also set out (see Table 3.2) in this section.

Implementation of the abductive strategy began with use of induction on data collected in an initial pilot stage – stage one. First, inductive reasoning used to develop a set of constructs. Deductive reasoning was then used to scrutinise the constructs and make theoretical connections. Constructs were developed and tested iteratively, as described by Saunders et al (2012):

“... inductive inferences are developed and deductive ones are tested iteratively throughout the research.” (ibid., p. 163)

Primary data collection took place in two stages (two and three). The constructs generated from data in stage one were used to provide a starting point for stages two and three. The constructs developed in stage one were refined in stages two and three, and further new constructs were developed. Data collection and iterations of induction and deduction continued to be used throughout these stages until no new constructs were identified and the data was considered to have converged.

A final stage of validation was conducted, and used deduction to validate the findings from stages one, two and three with professional project managers. The systematic programme of data collection and analysis is illustrated in Fig. 3.4. The time frame for the data collection is shown in Table 3.1.

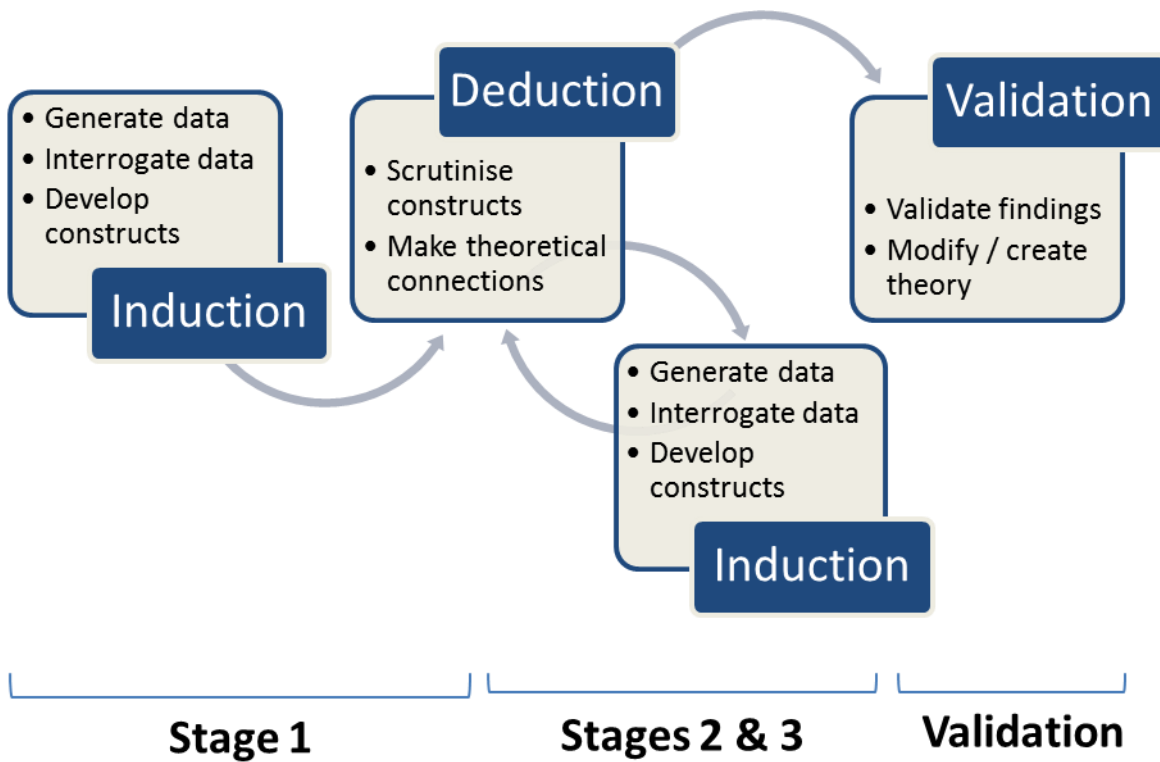


Fig 3.4 The abductive approach used for this research

Table 3.1 Data collection time frame

Stage	Time frame	Type of interviews
1 - Pilot	Mar - Apr 2013	Non-directed
2 – Primary data collection	Mar – May 2015	Non-directed
3 – Primary data collection	May – Jun 2015	Non-directed
Validation	Mar – Jun 2016	Directed

### Selection of a field site

There is wide variation in the organisational context of projects in industry, and this is one of many challenges for empirical research on projects. The organisational setting is one variable that can be addressed through the research design. Hence, this research was designed to take place at a single site, thereby limiting the variation between projects in terms of organisational characteristics.

The notion of conducting research on a single site, such as a laboratory, is commonplace in the natural sciences and reduces variation between experiments. A laboratory setting for this work was considered too removed from a natural working environment and unlikely to generate results that would be relevant in a wider industry context. Therefore, a site was required where projects were already taking place. A further requirement was to identify practitioners whose experience with social media pre-dated their experience of formally managing projects.

A survey of 2,700 project management professionals in the UK revealed almost 80% have attained at least an undergraduate degree (APM 2015). Hence, it is argued here that the project managers of tomorrow are undergraduates today. Furthermore, students have a high disposition to use the latest advances in technology.

Student projects, occurring naturally within the HEI setting, are often close to authentic workplace projects. The term 'natural experiment' is not appropriate for this research because experimental research involves assigning causes "randomly, or as good as randomly" (Dunning 2012, p3). In a natural experiment, "treatment selection is not related to relevant individual characteristics" (Remler and Van Ryzin, 2011, p.429), whereas here it is recognised that team characteristics and other factors may contribute to, or be determinants of, decisions about use of social media. Random assignment of characteristics to student projects was rejected on ethical grounds.

Students undertake projects in an HEI setting both formally, as part of the curriculum, and informally in sports clubs, voluntary activities and other group activities. The way students manage projects is not usually constrained by established organisational practice in the same way that project management practice is constrained in a commercial setting. Where a project is part of the curriculum, there will be academic considerations, but the HEI setting provides a relatively safe environment for experimentation and the development of practice.

Scope for experimentation in the commercial world is limited and project management practice tends to be shaped by traditional perspectives. Students, however, are disposed to experiment, with both efficient ways of working and the latest technology. Therefore, student projects provide a unique opportunity to gain insights into how practice might change in the future under the influence of new technologies and social practices. Hence, an HEI setting was chosen for this research.

All projects are context-specific and located in open systems (Smyth and Morris 2007). Researcher knowledge of the HEI setting provided an opportunity to control for the project context. Projects undertaken within the curriculum have an academic context and this varies from project to project, and amongst different HEIs. Researcher knowledge of one particular site enabled further control of the project context and therefore a single site was chosen.

The site chosen is a UK post-92 university with a focus on the professions and excellent links to industry. Learning at the site is geared to the workplace and courses include business studies, media, TV production, computing. Students on many courses undertake projects involving external stakeholders and utilise external resources. Stakeholders often include industry experts, collaborators, problem-owners and clients. Projects such as these closely resemble, and overlap with, many projects undertaken in industry settings.

In HEIs, the term 'student project' typically refers to an extended piece of self-managed coursework, often a dissertation. However, other types of student project more closely resemble workplace projects. For this work, relevant student projects are considered to be projects that meet the following requirements:

- engage external stakeholders,
- address a genuine organisational problem or opportunity,
- be expected to create artefacts to a professional standard,
- be undertaken in real time (i.e. not a historic case study), and
- undertaken by teams with three or more members.

The researcher has been an academic member of staff at an HEI for over twenty years, has worked as an external examiner at another HEI, and has visited many sites for conferences and professional events. The HEI where the researcher is an academic member of staff was chosen because many project are undertaken each year that meet the requirements for this research, and for accessibility by the researcher.

### **Selection of participants**

Participants self-selected to be interviewed for this research by responding to advertisements. Self-selection introduces bias into research. The motives of those who responded to the invitation to participate are not known and it is possible that those who were disposed to respond to advertisements are biased in favour of using social media and project management practices. A bias towards project management would support their inclusion in this research as they may be more inclined to enter the

profession in the future. Similarly, a bias towards social media use would mean they are more likely to experiment with novel ways of working that optimise use of social media.

Interrogating participants' motives would have been intrusive and could not have reasonably been addressed without jeopardising the integrity of the work. Care was taken to ensure that participants were neither harmed nor received any incentive or advantage as a result of participation (please refer to section 3.8 for details of the Ethical Considerations).

A Participant Information Sheet (see Appendix B) was used to provide an initial overview of the purpose of the research. Rather than guiding the interview with specific questions, the researcher provided an invitation for participants to talk freely about their experience and perceptions of using social media in managing one or more projects. During each interview, the interviewer used specific question to obtain further clarification as necessary. In addition, prompts were offered towards the end of each interview if one of the research objectives had not been mentioned. To avoid leading the discussion, the interviewer avoided using the four research questions during the interviews. The four research questions were used subsequently, to interrogate the data and inform analysis.

All interviews were audio-recorded and subsequently transcribed by the researcher. Data was generated from the transcripts as described in section 3.9.

### **Stage 1 - Pilot**

At the chosen HEI, final year business studies students have an option to undertake a consultancy project with an external client and stakeholders. These consultancy projects started in 2010 and the researcher has supervised such projects since 2010 until the present. These projects fulfil the requirements for this research and the researcher is familiar with the project context. In 2013, the work began with a pilot stage that focussed on the consultancy projects undertaken in the academic year 2012-13.

An invitation to participate in this research was advertised to the business students undertaking consultancy projects. The invitation was circulated to students using the virtual learning environment and email groups, and stipulated the requirement for the project team to be three or larger. Two teams responded to the invitation; one team comprised five members and the other had four members.

For each team, an in-depth, non-directive team interview was conducted by the researcher. An initial set of constructs was created and coded. The initial set of codes provided the foundation for data analysis in later stages.

### **Stage 2 – Primary data generation**

In 2015, the scope of the research was extended for stage 2. The invitation to participate was initially advertised to all business students, and subsequently extended to all undergraduate students at the university. Replies to the invitation were received from three teams and nine other individuals. Non-directive interviews were conducted with all three teams, and all three teams comprised business students.

An insufficient number of teams were identified and therefore individual non-directive interviews were conducted with the other nine individuals who responded.

Amongst the nine individuals who responded were students studying computing, TV production, fashion, and public relations, as well as business. Some were in their final year and others were in their second year of undergraduate study. Two of the respondents were interviewed together at their request and a further seven individual interviews were conducted. Constructs identified from analysis of the data were compared to the constructs and codes created during the pilot. The initial set of codes from the pilot was extended in Stage 2.

### **Stage 3 – Primary data generation**

Also in 2015, the research was extended to recent graduates. Extending the research in this was a first step to bridging the gap between an HEI setting and the commercial world. All members of the alumni panel for the business studies course were invited to participate in the research. Four members of the panel self-selected to be interviewed. All respondents were recent graduates and in graduate employment. The respondents elected to be interviewed in pairs and two non-directive interviews were conducted. Results from analysis of the data were compared with the constructs and codes created during stages 1 and 2, and the extent of similarity was assessed. Evidence of data convergence was revealed and is discussed in section 3.9.

A summary of the pragmatic steps taken to recruit participants for stages one, two and three is shown in Table 3.2.



Table 3.2 Summary showing how participants were recruited

Stage	Steps taken	Participants recruited	No. of interviews	No. of direct participants
1- Pilot	An invitation to participate in the research was posted on the Consultancy Project web site within the university's Virtual Learning Environment (VLE)	Two teams of final year business students undertaking consultancy projects	2	8
2 (i)	An invitation to participate in the research was posted on the Consultancy Project web site within the VLE	Three teams of final year business students undertaking consultancy projects	3	9
2 (ii)	An invitation to participate in the research was posted on Business School web site within the VLE	Individual final year business students involved with managing projects	3	3
2 (iii)		Second year students involved with managing projects	5	6
3	At a regular meeting of the Business School Alumni Panel, a verbal invitation was issued to all participants	Business studies alumni	2	4

### Validation

In 2016, validation was conducted by discussing the findings with professional project managers. This was a second step in bridging the gap between an HEI setting and the commercial world.

In validation, a deductive approach was used. The findings were presented to professional project managers and then researcher-directed interviews with individual professional project managers were used to validate the combined findings from stages one to three.

Participants for validation were selected using the researcher's contacts with the project management industry. Purposive selection was used to identify a sample of six participants that incorporated variety from across a range of generations, sex, industries, and size of organisation, as shown in Table 3.3. Two of the respondents

were interviewed together at their request and because they were attending the same event. A further four individual interviews were conducted.

At each interview, the findings from stages one to three were presented to the interviewee/s and they were asked to comment on the ideas from their own experience. All the validation interviews were transcribed and the data generated was compared to the constructs and codes created during the preceding stages. Similarity amongst the constructs was identified and validated constructs were identified. All data sources are shown in Table 3.4.

Table 3.3 Participants in validation

<b>Participant</b>	<b>Age range</b>	<b>Sex</b>	<b>Size of organisation</b>	<b>Industry</b>
G	50+	M	Large	Media
H	30-40	F	Small	Digital agency
J	50+	F	Large	Higher education
K	25-35	F	Medium	Communications
L	30-40	M	Large	Multi-national bank
R	50+	M	Medium	Local government

Table 3.4 Summary of all data sources

<b>Stage</b>	<b>Interview type</b>	<b>Participants</b>	<b>No. of interviews</b>	<b>No. of direct participants</b>	<b>No. of project participants</b>
1- Pilot	Non-directed, team	Two teams of final year business students undertaking consultancy projects	2	8	9
2 (i)	Non-directed, team	Three teams of final year business students undertaking consultancy projects	3	9	9
2 (ii)	Non-directed, individual	Individual final year business students involved with managing projects	3	3	12
2 (iii)	Non-directed, individual	Second year students involved with managing projects	5	6	24
3	Non-directed, pairs	Business studies alumni	2	4	>40*
Validation	Directed, individual	Professional project managers	6	6	>60*
<b>Totals</b>			<b>21</b>	<b>36</b>	<b>&gt;154*</b>

\* these are conservative estimates of the number of people involved in the projects under discussion

### 3.8 Ethical considerations

Ethical issues in organisationally located insider research can differ from other forms of research because of role duality, i.e. the researcher holds an ongoing work role and power relationships associated with this as well as the researcher role (Holian and Coghlan 2013). The Research Ethics Code of Practice for the university that provided the setting for this research, and was current at the time the pilot data was collected in 2013, set out seven key principles that have been adhered to, as follows.

- “Research should be designed, reviewed and undertaken in ways which ensure integrity and quality” (BU 2009, p.2).

Integrity and quality have been embedded in this research from the design stage onwards. At the time the opportunity arose to collect the pilot data, both the literature review and design of the method were at an early stage and incomplete. However, as Mason (2003, p.67) noted, a qualitative researcher can work hard on the structure and flow of an interview to generate data relevant to the overarching research question from a loosely structured interview that feels (to the interviewee) like a ‘conversation with a purpose’. Qualitative interviewing was chosen to give the interviewee more control (than a more structured format might allow) and because this approach is “more likely to generate a fairer and fuller representation of the interviewees’ perspectives” (Mason 2002, p.66).

- “Participants and research teams must be as fully informed as possible about the purpose, methods and intended possible uses of the research, what their participation in the research entails and what risks are involved” (BU 2009, p.2).

This principle was addressed firstly by setting out the purpose of the research and arrangements for the meeting in the invitation sent to those undertaking real projects:

*“You are invited to participate in research on the use of social media in managing projects. If you are working in a team with 3 or more members then I would be interested in hearing about your communication practices. If, as a team, you are available for no more than one hour and would like to discuss your use of social media, please email me to arrange a meeting at a time convenient to yourselves.”*

In addition, before starting each interview, the purpose of the research was stated, the voluntary nature of participation was highlighted with the option of ceasing participation

at any time, and permission was sought from the participants to make an audio recording of the meeting. The narrative used is shown below and audio recording commenced only after all participants verbally indicated their agreement.

*"Thank you for offering to share your project communication experiences with me. My research is focused on the use of social media for project collaboration. No individuals will be named in the research, either team members, the client company or contacts. Your participation is entirely voluntary and does not form any part of your assessment. If anyone individually wishes to leave at any point, or can only stay for part of the hour, please feel free to leave at any time - this will not be a problem. It would be helpful to me if I record the session - is that ok?"*

By the time the primary data collection was undertaken in 2015 and 2016, the Research Ethics Code of Practice had changed and a formal Participant Information Sheet was provided to each participant (see Appendix B).

- "The confidentiality and anonymity of the information supplied by participants must be respected" (BU 2009, p.2)

No individual participant has been identified in the data collected and no personal data was recorded. Quotations from the audio recording have been attributed to the team rather than an individual. Team identities have been obscured and team names replaced with a single character used to separate the teams.

- "Research participants must participate in a voluntary way, free from any coercion / gratuities" (BU 2009, p.3)

For the pilot, attendance at a pre-arranged meeting provided evidence of consent to participate in the research. At this time, written confirmation was considered unnecessary and would have added to the time required for participation, perhaps increasing perceptions of formality. The purpose of this data collection was to obtain a team perspective and the formality of requiring individual written consent may have inhibited freedom to contribute fully as a team.

For the primary data collection in 2015 and 2016, consent to participate was formally recorded using a Consent Form (see Appendix B). A copy of the Participant Information Sheet and two copies of the Consent Form were provided to each participant prior to

the interview. In each case, a signed copy of the Consent Form was retained by the Researcher.

- “Harm to research participants must be avoided” (BU 2009, p.3)

Communication practices are not assessed therefore the research did not prejudice the grades awarded for the projects or for individual team members’ reviews. All Project work is double marked and reviewed by an External Examiner before being presented to the exam board and the university’s robust quality control procedures were followed. An additional step, taken for all Consultancy Projects due to the authentic nature of the work, was a review of all grades for supervisor or client company bias; and no bias was found. Steps were also taken to avoid perceptions of prejudice by ensuring all data collected was made anonymous and by emphasising the separation between research and assessment.

- “The independence of research must be clear, and any conflicts of interest or partiality must be explicit” (BU 2009, p.3)

Dual roles of both the researcher as supervisor and participants as students were explicitly addressed. Arrangements for the meetings at times to suit the participants were made by email correspondence. The meetings took place in an office setting, rather than a teaching room, and were outside of the teaching schedule, to put distance between the two distinct roles of the researcher as supervisor, and the participants as students.

- “Ethical approval must be obtained before research is commenced” (BU 2009, p.3)

The research design and ethical considerations were approved by the research supervisors, initially at a meeting on 13/7/11 (audio recording 46:52) and reviewed again on 1/3/13 (audio recording 26:30). Furthermore, ethical considerations were interwoven in all supervision meetings. The primary ethical issue explored was the role of students as participants. The guiding principle used in arriving at decisions about the approach was that of doing no harm. In order to address this principle, advantages and disadvantages of participation were considered, and so too were the advantages and disadvantages of non-participation. All the students within the population had the opportunity to participate, regardless of who was supervising the project and, as communication practices were not assessed, the impact of participation was

considered neutral. This was compared with the potential benefits of this research to the student body as a whole through improved understanding of social media use by students. The timing of the research was close to the end of project work by the teams and therefore any opportunity for the research to change their behaviour through reflection on their practice leading to improvements in performance was negligible. The other issue discussed was that of confidentiality of the client organisation and external stakeholders. This issue was addressed through ensuring any references to individuals or organisations were made anonymous.

The university's Research Ethics Code of Practice was reviewed in 2013 and a new Code of Good Research Practice published in August 2014 (BU 2014). The collection of data beyond the pilot was subject to the new code of practice. Under the new regulations and following a thorough review, formal ethical approval was granted by the Research Ethics Committee in January 2015.

### 3.9 Data generation and analysis

All interviews were audio recorded. The subject of the interview was assigned a unique identifier, a letter of the alphabet. The researcher transcribed each interview shortly after the interview took place, to increase the likelihood of accurate recall of meaning. As far as possible, each recording was transcribed verbatim and as accurately as the quality of the recording would allow. Some recordings were easier to hear than others, due to background noise and the volume of the interviewee's voice. Time markers were included in the transcriptions at frequent intervals to facilitate listening to a recording multiple times.

All interviewees were native English speakers but, never the less, the words used were not always easily recognised by the researcher due to the colloquial language used by some participants. During the interviews, the researcher sought clarification on occasions but overall the level of interruptions was kept to a minimum to avoid contaminating the interview with researcher bias, and to ensure the interviewee's narrative was as natural as possible.

Punctuation was added during the transcribing process to preserve the researcher's understanding of the narrative at the time. The addition of punctuation also helped to improve readability of the text. Where individual words, or portions of the recording, could not be deciphered, a question mark within square brackets was recorded in the transcript. Where a team was interviewed, individual team members are not identified, but "/" is used to denote a change of speaker. An example of an interview transcription is shown in Appendix C. Words spoken by the interviewer are denoted with an "I" in the first (left most) column. A letter is used in the first column to denote the individual or team being interviewed. The time into the recording is shown in square brackets in the first column. To achieve anonymity, the proper names of people and companies were not transcribed and a generic term is shown in square brackets in the transcript.

Data for this research was generated from the interview transcripts in two ways. In the pilot stage, recursive data abstraction (see below) was used to generate an initial set of constructs. The constructs were codes and subsequently used to inform thematic analysis of the data in the three further stages that followed.

### **Recursive data abstraction**

In the pilot stage, two non-directive team interviews were conducted and the teams are identified as A and B. Each team interview lasted in excess of an hour. Both interviews were transcribed and data was generated using an adaptation of the process of recursive data abstraction described by Polkinghorne and Arnold (2014). Jivaketu (2015) suggests their process enables the researcher to “treat all data without bias” (ibid., p.73). The suggestion that data can be treated with no bias is unrealistic and fails to recognise the role of the researcher in interpreting and analysing data. However, using a standardised process minimises bias and optimises consistency.

Polkinghorne and Arnold’s (2014) process for recursive data abstraction, as used by Guzys et al (2017), Haines et al (2016) and Jivaketu (2015), has six steps and assumes a structured interview technique has been used. Here the interviews were unstructured and Polkinghorne and Arnold’s (2014) process was adapted as described below and summarised in Table 3.5.



Table 3.5 Summary of the recursive abstraction approach

Step	Polkinghorne and Arnold (2014)	Adaptation for this work
1	A set of interview questions are developed. The same interview questions are applied to each interviewee with their answers being recorded and written up into a transcript. Everything of interest is highlighted.	Non-directed interviews were recorded and transcribed. A set of research questions was developed. The same research questions were used to interrogate each transcript and identify sections of interest. Selected sections of narrative were highlighted in colour to correspond with the relevant question.
2	Transfer the highlighted data into a table with the question topics on the left (vertical axis) and a column per interviewee across the top (horizontal axis).	Highlighted data from the first interview was transferred into a table and grouped by research question. A single table was created for each interview.
3	Paraphrase the data to make it more manageable and concise. Keep sense of the interviewee's original comment.	Narrative extracts were paraphrased for conciseness, retaining the sense of the original comment.
4	Where possible combine questions on similar topics to form themes.	The data was reviewed for patterns, duplicate extracts were combined and paraphrased again for clarity and completeness. Patterns between themes were identified and codes (for the type of technology used) were used to connect data between themes.
5	Code the remaining responses for each interviewee. Codes can easily be compared to each other and may be a single word or multiple words.	Steps 1 to 4 above were repeated for the second interview and a second table was created.
6	Rearrange the order of the columns using each of the control data variables to look for patterns in the responses.	The results from the two interviews (in the two tables) were compared. Themes and data were reviewed again by weaving between the original recordings, transcripts, context and constructs. Similar constructs were combined, duplicates removed and a consolidated list was created. Codes were added to the consolidated list of constructs.

Step one in Polkinghorne and Arnold’s (2014) process is to record and transcribe structured interviews, then to highlight “everything of interest” (ibid. p1). For this work, the transcripts were read literally and then interpretatively. A set of four research questions were developed from the research objectives, as shown in Table 3.6, and these questions were used to interrogate the transcripts. The process of interpreting the narratives and developing constructs was iterative and involved multiple readings of the transcripts.

Table 3.6 Development of research questions

	<b>Research objective</b>	<b>Research question</b>	<b>Coding colour</b>
1.	To understand what social media are relevant to managing projects.	What social media were used?	Green
2.	To investigate the factors that influence use of social media in project settings.	What factors influenced the choice and use of social media?	Blue
3.	To explore the behaviours involved in using social media to manage projects.	How were social media used in managing the project?	Red
4.	To explore perceptions of the impacts, consequences and concerns of using social media in project settings.	What were the impacts, benefits and consequences of using social media?	Purple

In step one, sections of each narrative were selected where they corresponded to one of the research questions and were colour coded to indicate relevance to a specific question.

For question 1, sections of narrative were selected using a literal reading of the transcripts. Key words were identified and the context in which the word occurred was used to validate the selection. Key words were easily identified where the name of a particular social technology was already known to the researcher, such as Facebook or Skype. Where an unfamiliar term was used, the context and in some cases an additional question by the researcher was used to validate the selection. For the other three questions, data were generated using interpretative readings of the transcripts. Selection of narrative for question 2 relied heavily on the context and the nouns used, while for question 3 verbs were identified and interpreted within the context. Data were generated for question 4 by finding deeper understandings in the transcripts and

selecting sections of narrative that were interpreted as consequences of using social technologies.

A limitation of the software used (Microsoft Word) meant each word could only be coloured once. To preserve context and meaning, some parts of the narrative have been included in two different extracts. The colour-coded transcript of the stage one interview with Team B is included in Appendix C.

Step two in Polkinghorne and Arnold's (2014) process is to create a table with "the question topics on the left ... and a column per interviewee" (ibid., p.1). The highlighted data is then transferred into the table. In this work, one table was created for each interview, with a row for each the research question and a column for each step. Highlighted data was transferred into the table and grouped by research question. Where necessary to retain the meaning or context of the extract, additional words were added in square brackets.

Polkinghorne and Arnold's (2014) step three is to "paraphrase the data to make it more concise and meaningful" (ibid., p.2). Here the in each table was paraphrased for conciseness, and care was taken to ensure the sense of the original comment was retained. Duplication was identified by striking through the duplicate data in the third column of the tables.

Step four in Polkinghorne and Arnold's (2014) process is "where possible combine questions on similar topics to form themes" (ibid., p.2). The interviews in this research were non-directive so, instead of focussing on combining questions, the data in each table was reviewed for patterns, duplicate extracts were combined and paraphrased again for clarity and completeness. Elements were grouped together, and themes and categories were identified. Codes for the types of technology used were created to enable connections to be made with other elements.

Polkinghorne and Arnold's (2014) step five involves coding the remaining responses. In this work, steps one to four were repeated for the second interview and a second table of constructs was created. The results of the data analysis for Team B, through steps two to four are shown in Appendix D.

Step six is concerned with looking for patterns across the data set (Polkinghorne and Arnold 2014). Here, the sixth and final step in analysis of the data generated in the pilot stage was to compare and contrast the themes and constructs developed from the

two interviews. Themes and constructs data were reviewed by weaving between the original recordings, transcripts, data, interpretations and coding. Patterns between themes were identified and understandings of the constructs were developed. A coding structure was developed, as shown in Appendix E. The output from step six was the set of constructs and codes that were used in the analysis of data in later stages. An example of the results of data analysis in stage two is shown in Appendix F and an example from stage three in Appendix G.

### **Thematic data analysis**

In stages two and three, the data was analysed using a combination of thematic analysis using the codes generated in the pilot stage, and where new ideas were identified, steps one to four as described above were used to develop new constructs. In this way, stages two and three used deductive reasoning to a greater extent than the pilot stage. New constructs and codes were added to the list generated in the pilot stage. The process of generating and analysing data continued until the data converged.

Twelve participants were engaged in non-directive interviews in stage two. The interview duration varied from 6'36" to 16'24". Three of the interviews were team interviews and of the other nine participants, seven were interviewed individually and two were interviewed together. Stage two was organised in three parts. The first part (a) comprised the three team interviews and all the participants were business students. The second part (b) involved other business students who participated in projects that met the requirements for this research. The third part (c) involved students on different courses at the same HEI who were asked to select a project they had worked on that met the requirements for this research.

Stage three data was generated by conducting two non-directive interviews, each involving two participants. The duration of these interviews were 11'9" and 33'7" respectively. The third part involved alumni of the business studies course at the same HEI. Two of the participants worked at the same company and were interviewed together, on the company site. The other two participants worked in the finance sector, both attended an alumni event at the HEI and were interviewed together at the HEI.

All the interviews in stages two and three were transcribed. Literal and interpretive readings of the texts were undertaken by the researcher, supplemented by re-listening to the audio recordings as necessary to understand and interpret the narratives. New constructs were explored, defined, coded and added to the list from the pilot stage. An

example of the results of analysis of data from an interview in stage two can be seen in Appendix F, and from a stage three interview in Appendix G.

### **Reliability and data convergence**

Reliability refers to “the degree to which a measure of a concept is stable” (Bryman and Bell 2003, p.573). Often reliability is conceptualised in terms of the accuracy and preciseness of the research instruments, and how consistently these are used to take measurements. As Mason (2002) notes, this conventional view is more comfortably associated with quantitative research than with qualitative. In qualitative research, reliability:

“is expressed in terms of ensuring - and demonstrating to others – that your data generation and analysis have not only been appropriate to the research questions, but also thorough, careful, honest and accurate (as distinct from true or correct – terms which many qualitative researchers would, of course, wish to reject).” (Mason 2002, p.188)

Non-direct interviews were used and these were deployed consistently throughout the research. In all of the three stages, participants were free to discuss any and all aspects of the phenomenon they chose. All interviews, transcribing and analysis of data was conducted by the same single person to ensure a consistent process. Generation of data from the audio recordings was thorough in that each recording was listened to as many times as was required for the researcher to transcribe the narrative accurately. The number of times each recording was played during the transcription process varied depending on the level of background noise and quality of speech.

Reliability is sometimes measured by

“... observing the consistency with which the same methods of data collection produce the same results.” (Mason 2002, p. 187)

In this work, the consistency of the results has been measured using the number of constructs identified in each stage, as a proxy for assessing stability of the results. For the pilot stage (stage one) all the constructs were new and a total of 65 constructs were identified. In stage two a total of 18 new constructs were added to the initial list and in stage three, 3 further new constructs were added. In total 88 constructs were identified and of these, 74% were identified in stage one. The numbers constructs in each of four themes are shown cumulatively by stage in Fig. 3.5. The number of new constructs as a proportion of the total number of constructs in each stage has been calculated as a measure of data convergence and is shown in Fig. 3.6

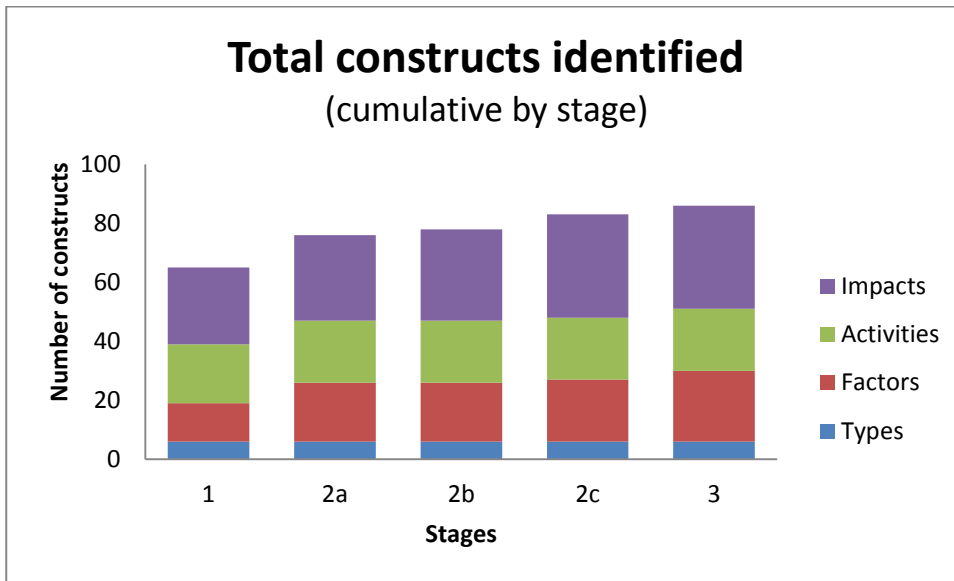


Fig 3.5 Constructs identified by stage

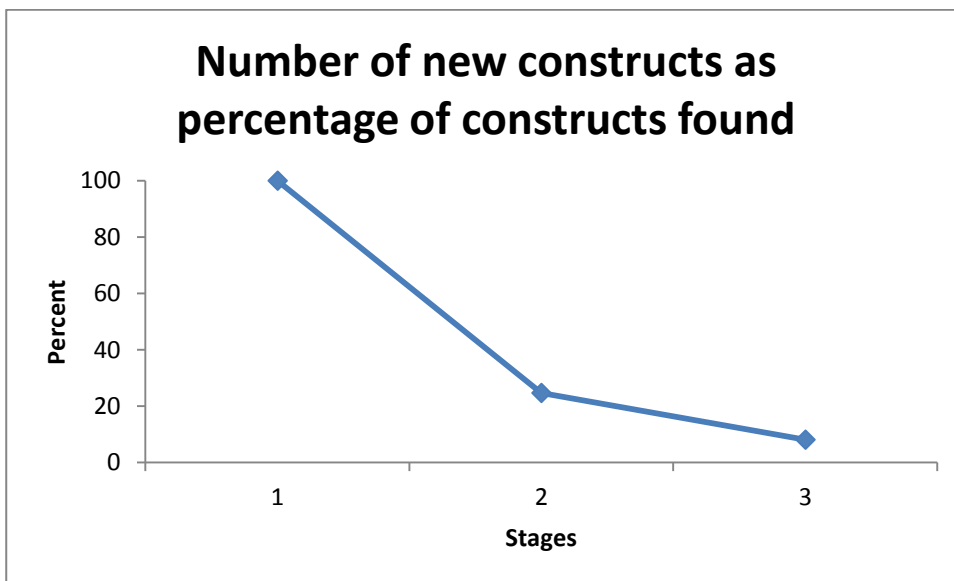


Fig 3.6 New constructs as a proportion of constructs found in each stage

Consistency in the process of analysing the data is also important in establishing reliability and has been described in detail in this chapter. However, social media practices are evolving rapidly and practices are changing, as new technology is deployed and human engagement changes over time. New opportunities are exploited and limitations either overcome or drive changes in practice. During the time this research was conducted, changes have been observed, for example growth in use of

WhatsApp. The practice of project management is also evolving rapidly. Therefore, if this work was repeated in the future it is likely that some constructs may have become obsolete and new constructs may be found. This work is located in the period 2013-2016 and reflects practices amongst the selected population at that period of time.

Reliability does not confer validity of the data, but validity presupposes reliability. Having established the reliability of the data, consideration is now given to validity.

### Validation

Validity is concerned with “the integrity of the conclusions that are generated from a piece of research“ (Bryman and Bell 2003, p. 575). Reliability of the data is a prerequisite for validity but is not sufficient. The purpose of qualitative practice-based research is to develop explanations and arguments that are generalizable in some way (Mason 2002). In qualitative research, the central issue is

“... the theoretical reasoning ... and how well the researcher generates theory out of the findings” (Bryman and Bell 2003, p.56).

In this research, a final stage was conducted for the purpose of validation by testing the results from the first three stages with a wider professional audience. Extending the research in this way provides justification for generalising the findings beyond the HEI setting.

Validation involved interviews with six professional project managers from a range of organisations. The findings from the first three stages were presented to each of the participants prior to conducting a non-directive interview. Participants were invited to comment on the extent to which they could relate the findings to their project management practice and provide their comments on the validity. The duration of the interviews varied from 4’13” to 11’39”. The data was analysed using an approach similar to the data analysis in stages two and three, although the reasoning in validation was more deductive. An example of the results of data analysis from an interview in validation can be seen in Appendix H.

An additional, final step was conducted in which the constructs and codes identified in validation were correlated with the data from the earlier stages. Where constructs were identified in both validation and in earlier stages the data was considered to have been validated. Overall, 64% (n=56) of the constructs were validated and two new constructs were identified. The findings from all four stages are presented in the next chapter.

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## **4 Findings**

### **4.1 Stages**

The research was conducted in three stages, followed by validation. Thirty participants were involved in stages one to three, and six were involved in validation. The 36 participants discussed projects that involved in excess of 150 people, as shown in Table 3.4. The data from each stage were analysed separately, as discussed in the previous chapter. In this chapter, each stage is discussed in turn. The findings for each participant are presented individually and then the findings from the stage are summarised. The final section synthesises the findings from all stages and provides a final summary.

## 4.2 Stage one (pilot) findings

The data generated from analysis of the transcripts of the team interviews in stage one are presented in this section. For each team, the contextual data is presented first; followed by analysis of the social technologies used, how they were used and their impact; and a summary is provided for each team. The data from the teams are then compared, synthesised and a summary is presented at the end of this section.

### Team A

Team A comprised five final year business students, made up of one female and four males, and all team members were in the age range 21-25. The researcher, as a member of the teaching team on their course, was known to all members of the team. The team self-selected to participate in this research by responding to an invitation sent to all business students undertaking team projects.

Amongst the members of Team A there was a range of understandings, knowledge and skills of project management gained from students' studies and their experiences on placement. One feature of the university framework for such projects was that teams were able to adopt communication practices of their choice. Communications media, frequency or content were not prescribed by the university and teams were encouraged to use what they considered to be optimal for managing their project. Similarly, although there was a requirement to demonstrate management of the project, teams were encouraged to select and use approaches and techniques that they considered to be effective.

Team A undertook a project for a client organisation that was external to the higher education setting. The client organisation was the largest engineering company in Europe with branches worldwide, and the project was concerned with looking at the environmental impact of the IT function of the company for the north-west Europe sector. The project formed part of the students' studies, beginning in October 2012 and finishing in April 2013, and was formally assessed by the university after the data was collected for this research.

A focus group meeting was conducted with Team A on the university campus in March 2013. All five team members were present and the duration of the meeting was 1 hour 15 minutes. The team was already known to the researcher and it was known that all team members were in the fourth and final year of a business studies degree course and had all spent the third year undertaking a 40-week industrial placement in different companies. Four of the five team members had worked together on projects in the first

and second years of the course, and the fifth member of the team was known to the other team members before commencement of the final year project. The remainder of this section presents the findings from analysis of the data generated by analysis of the transcript of the meeting with Team A.

A range of social technologies were discussed by the team and six types were identified, as follows (see Glossary for definitions of terms):

- Social network - Facebook and subsequently Podio and Podio App
- Shared workspace – GoogleDocs, DropBox and wiki (within a VLE)
- Instant messaging and notifications – Podio, Podio App and GoogleDocs
- Micro blog – Twitter
- Online meeting – Skype
- Video – YouTube.

Team A discussed using both Podio and the Podio App. The Podio App is software that enables mobile devices to access and use Podio. Use of the Podio App was integrated with use of Podio as a social network, as illustrated here:

“... we have the Podio App as well, it would be almost like sending a text message anyway as I'd get a notification when anything changes on there.” (Team A, p.1)

A wiki was provided within the university's virtual learning environment (VLE), and use was required for assessment purposes. Team A used the wiki only because of the university requirement to do so, and it was used as a type of shared workspace, as explained below:

“We've also used the wiki for other things, and so for meeting minutes ... we put those straight onto the wiki. So, in that sense, there's no point in duplicating it on Podio when we know we can always go to the wiki to find the latest meeting minutes. We probably wouldn't use it [?]. Because the wiki's functionality isn't as good as Podio's but it's what we are getting marked on” (Team A, p.6)

Hence, Team A's use of a wiki has been classified as a shared workspace for the purpose of this research.

A joint email account was used for external communication by Team A but not for communication amongst team members. Within this work, email is not considered to be a social technology and, although it is noted that this was used for external communication with the client organisation, is not considered further here.

### Team A: factors influencing choice and use

Three types of perceptions that influenced the choice and use of a social network by Team A were identified: perceptions of using the technology, called technological characteristics by Kügler et al (2013); perceptions of characteristics of the team; and perceptions of characteristics of the task, here referred to as team and task characteristics respectively (the number of characteristics of each type is shown in brackets for each type):

- Technological characteristics (8)
- Team characteristics (3)
- Task characteristics (2).

**Technological characteristics** that are concerned with perceptions of the functionality of the social network are the support for project management activities (Ft6a) and the support for discussions (Ft6e), as explained in these extracts respectively:

“we did start using Facebook at the beginning of the project, but it’s not as good as Podio. It’s fine for messaging, and for communication, but Podio’s a lot more project management focused.” (Team A, p.1)

“So on pages when you upload something, and you’ve got to use the discussion board, to start talking. That was one of the key drivers for Podio, the idea that we can start discussing the work and the collaboration like [name] said that integrates to your phone, so we actually get it instantly.” (Team A, p.6)

Access to the social network from mobile phones (Ft1) was a non-functional characteristic of the technology that was highlighted above, and was also identified earlier in the transcript:

“...he hasn’t got a smart phone that is capable of App of Podio, and therefore often there’s gaps where if he’s not on a computer he won’t look at Podio so do you think that, the mobile phone has helped us integrate more with Podio? I think that is, our finding isn’t it / Mm mm / Having a mobile phone makes you use Podio far more” (Team A, p.4)

The format of files supported (Ft6d) influenced the choice and use of both the social network and the shared workspace, as shown in this extract:

“The reason why those things are better on Podio is because GoogleDocs PowerPoint presentation is a different format to Word, / so you wouldn’t want to cross those two things together. GoogleDocs is only really good in terms of functionality for a Word document or an Excel spread sheet, really, at the moment.” (Team A, p.2)

A capability for synchronous editing of a document (Ft6c) was also identified as a factor that influenced use of the shared workspace:

“... you can have two people editing it at the same time...” (Team A, p.2)

Cost (Ft4) was another non-functional characteristic that influenced the choice and use of the social network and shared workspace, as explained in these two extracts:

“some of those features are paid for, er, which we aren't using at the moment” (Team A, p.2)

“Sharing files, so the Podio thing the reason why we moved from that, we used too much DropBox space, they wanted us to pay more money, so we'd heard about the Danish guys who'd set up Podio so we just went to that instead. We actually transferred all our DropBox stuff onto Podio, to save money.” (Team A, p.9)

In the extract immediately above, some similarity between the functionality of Podio, described as a social network, and the functionality of DropBox, a shared workspace, is identified. Ease of use (Ft2), a non-functional technological characteristic, that influenced use of the social network and shared workspace, as shown here:

“I think you can share files but not with the same, like, ease, so it would be within a message stream ...” (Team A, p.9)

Also mentioned as an influence on choice and use of the social network was the extent of customization available for individual users (Ft3):

“... you can customize your own Podio work status according to what kind of features you want it to do.” (Team A, p.2)

Three **team characteristics** influencing use of the social network were identified – communications preferences (Fm1), prior experience with the technology (Fm2), and social ties (Fm3):

“...as technology [Podio] is very similar to a social networking site or a web site that everyone uses daily...” (Team A, p.3)

“... it [Podio] works with us because we're so familiar with Facebook.” (Team A, p.7)

“...it's fine because we're all friends, but, because, the whole social media thing is more friend based, this is work based, and having that one, that one stream is, is really good, it feels like a pr, professional environment ...” (Team A, p.8)

Two **task characteristics** were identified. The format of the document involved (Fk2) influenced use of the social network and shared workspace, and the nature of the task,

specifically the extent of conversation required (Fk1), was identified in relation to use of the social network, as shown in these two extracts respectively:

“...we'd chuck it on Podio, we'd both do our bit, take it off there and do our own bit separately, and then upload it again to that. The reason why those things are better on Podio is because GoogleDocs PowerPoint presentation is a different format to Word...”  
(Team A, p.2)

“I don't think Podio would be a substitute for that. You can't have that level of conversation, or, for us, you know that's quite a detailed, important discussion to have.”  
(Team A, p.10)

Next, the Team A narrative was analysed from the perspective of how the social network was used.

### **Team A: how social media were used**

Twenty project activities involving social technologies were identified for Team A and have been grouped into four themes (the number of activities in each is shown in brackets):

- Engaging team members (5)
- Project work (3)
- Management activities (7)
- Communication across the project boundary (3).

Within the theme of **engaging team members**, instant messaging was used to organize meetings (Ae1); and the social network and shared workspace were used to provide support for meetings (Ae1), as identified in these extracts:

“But texting and calling is mostly just about what time we're meeting today.” (Team A, p.1)

“...have a meeting, assign actions and from that just put them straight onto Podio.”  
(Team A, p.2)

Conducting meetings (Ae2) involved use of an online meeting facility, Skype, when members of the team were remote. However, even when team members were not remote, the social network, and in particular a daily project update, was perceived as enabling regular contact with the project and amongst team members. Team A likened use of the social network to a daily meeting:

“...on Podio it's like you're having a little meeting every day, because you're seeing what other people are doing and you're getting updated on the status of the project.”  
(Team A, p.4)

Informal information sharing (Ae3) was perceived to be enabled by the social network and instant messaging, as identified here:

“For internal communication will be between us, mobile phones and Podio, texting, quite informal.” (Team A, p.1)

“at any time of the day, we’ll all be putting different things into that. Um, things like knowledge sharing is really, easily achieved, on that.[Podio].” (Team A, p.2)

The social network was perceived as enabling feedback (Ae4), reminders, requests and prompts (Ae5), as explained here:

“It’s mainly the reminders part of it. Um, if someone, or if we decide upon something, or someone may upload their work. In a meeting we would usually share our work, and give feedback. But over the past few months, instead of meeting up, we’ve been doing it through Podio. If someone uploads their work, and says, can anyone take a look through this, um a couple of people will probably write comments on it, eh, and that’s the form of feedback, a couple of changes and that’s it, done. Um, rather than going through a sit down meeting and doing that...” (Team A, p.5)

The three activities identified within the theme of **project work** were storing (Aw1) and sharing information (Aw2), and sharing work (Aw3), all involving the social network and shared workspace, as explained in these two extracts:

“You have something up from GoogleDocs and then everyone’s got access to it ... Write whatever you want to into that document, it automatically saves it, so you don’t ever have to pass it around or send it round, because everyone in the team has access / Like [name] was saying you can have two people editing it at the same time.” (Team A, p.2)

“... they’re kind of, our live documents. What with the Podio documents, that we upload to Podio are things that we need to share, to add to in our own time, things like presentations, mainly. Stuff like our final presentation, if we’d worked on it together, and then we would, and then say for instance,/ [name] has to do a couple of things to his slide, and I’d have to do a couple of things to my slide / And then we’d chuck it on Podio, we’d both do our bit, take it off there and do our own bit separately, and then upload it again to that.” (Team A, p.2)

Seven project **management activities** involving social technologies were identified, as follows. Assigning tasks and recording allocation (Am1), checking work progress (Am2) and reporting task status (Am3) all used the social network and notifications, as explained here:

“if she sets me a task and I’ve done it, she finds out like that ...Once the task is assigned to you, on the right of your home Podio screen, it’s all there in front of you, the tasks staring at you.... I physically click it, the task will go from my screen and send a notification to whoever assigned the task within the group. / It’s like a little tick box and once you’ve ticked the box it means you’ve completed the task and it will be removed from your list. ... every time someone finished it I’d get a notification from that, but I can also see who hasn’t finished it.” (Team A, p.1)

Change management (Am6) involved the social network, notifications and the shared workspace, as explained here:

“Also cos we have the Podio App as well, it would be almost like sending a text message anyway as I’d get a notification when anything changes on there” (Team A, p.1)

“I might be, have a better understanding of one change so it be better for me to write it on [GoogleDocs]” (Team A, p.2).

Decision making (Am4) involved the social network:

“... if we are going to make a decision, about things like doing some work, then we put in on Podio, with our notes and our comments.” (Team A, p1.)

Capturing lessons learnt (Am7) and a project diary (Am5) both involved creating and sharing videos, and use of the social network and shared workspace, as explained here:

“... we get together and reflect on the previous two weeks and do our video diary” (Team A, p.6)

“... the video logs are roughly 5 minutes but not only do you get the lessons learnt, you get our update of what we’ve been doing, you get an update of what we’re going to be doing in the next two weeks (Team A, p.13).

Three activities involving social technologies were identified within the theme of **communication across the project boundary**. A micro blog was used to gather external information (Ab2), and the micro blog and video sharing were used to distribute project information externally (Ab1):

“... with Twitter I can follow certain accounts, like er Guardian Green and the Green Grid for instance, and get all the information to me in one feed. So when we do our market research I can get all the links...” (Team A, p12.)

“... we created a Twitter page for [team name] to, also the information we find useful, we thought well let’s share that information and pass it on. [?] we tweeted that so there are people following us now.” (Team A, p.12)

“... for people viewing the project video’s also a nice way for you to see what’s going on...” (Team A, p.13)



Finally, the Team A narrative was analysed to identify the impact and consequences of using social technologies for managing a project.

### **Team A: impacts and benefits**

Team members discussed their perceptions of a range of impacts and benefits of using social technologies, and seven themes were identified (the number of impacts in each is shown in brackets):

- Efficiency benefits (4)
- Quality of work (1)
- Information management impacts (4)
- Flexibility (3)
- Transparency (2)
- Creativity (1)
- Emotional impacts (4).

The theme emotional impacts was used to collectively refer to consequences of using social media that participants indicated had an affective impact on themselves or other team members.

**Efficiency** was discussed by the team in terms of the social network saving time (Is1) and reducing the need to physically meet (Is2):

“... it saves us huge amounts of time ... attention through the App and using Podio, it's been focused and we've been able to drive this project perhaps earlier than other people have, and be more efficient ...” (Team A, p.3)

“... over the past few months, instead of meeting up, we've been doing it through Podio.” (Team A, p.5)

Overall, the social network was considered to contribute to driving the project (Is4):

“... so there's a good pressure to be able to keep driving that momentum forward and therefore we've been able to complete a large project in the way that we have ...” (Team A, p.4)

Use of a micro blog was also considered to be efficient (Is1) for gathering information:

“... there was so much information out there on the Internet, but with Twitter I can follow certain accounts, like er Guardian Green and the Green Grid for instance, and get all the information to me in one feed.” (Team A, p.12)

The shared workspace enabled synchronous document editing (Is3) and this has been interpreted as contributing to efficiency:

“... you can have two people editing it at the same time [GoogleDocs].” (Team A, p.2)

The social network was also used to facilitate feedback on work (Iq1) and feedback is considered likely to improve the **quality of work**:

“If someone uploads their work, and says, can anyone take a look through this, um a couple of people will probably write comments on it, eh, and that’s the form of feedback...” (Team A, p.5)

A range of impacts in relation to **information management** were identified. Benefits of using the shared workspace were identified as eliminating the need to send documents (Im1), easier knowledge sharing (Im2), and avoiding duplication (Im4):

“... you don’t ever have to pass it around or send it round, because everyone in the team has access... things like knowledge sharing is really, easily achieved, on that... it saves duplication basically, we can all do it at the same time and it saves it for you.”  
(Team A, p.2)

Easier knowledge sharing (Im2) was also identified as a benefit of using a micro blog:

“... we created a Twitter page for [team name] to, also the information we find useful, we thought well let’s share that information and pass it on. [?] we tweeted that so there are people following us now.” (Team A, p.12)

Use of the social network facilitated sharing of informal information (Im5), as indicated here:

“... you’re seeing what other people are doing and you’re getting updated on the status of the project.” (Team A, p.4)

**Flexibility** was identified as an impact of using the social network and shared workspace; enabling team members to work in their own time (If1) and in any location (If2):

“Um, rather than going through a sit down meeting and doing that, it’s now Podio is a facilitator for us doing that in our own time.” (Team A, p.5)

Use of online meetings also contributed to flexibility in terms of location (If2). The social network and notifications contributed to flexibility by enabling tasks to be assigned in response to change (If3), as explained here:

“I’d get a notification when anything changes on there... Posts a document, or writes a comment, or makes a change, or likes, you can like people’s comments like on Facebook / Or if she sets me a task...” (Team A, p.1)

Perceptions of **transparency** and a flat structure were associated with use of the social network ensuring all team members had the same information (It1), as explained in these two extracts:

“We’re all on the same page, its that platform, we’re all on the same level. Because the information is all there, we can access it, we can just go to Podio and it’s there.” (Team A, p.3)

“Podio is, just into the work space one stream. So it almost, massively transparent, and, it means that you don’t have that kind of privatized feel, or I dunno, everyone’s on the same level...” (Team A, p.8)

Transparency was also linked to all team members having visibility of work and status (It2) as illustrated here:

“if she sets me a task and I’ve done it, she finds out like that ...Once the task is assigned to you, on the right of your home Podio screen, it’s all there in front of you, the tasks staring at you.... I physically click it, the task will go from my screen and send a notification to whoever assigned the task within the group. / It’s like a little tick box and once you’ve ticked the box it means you’ve completed the task and it will be removed from your list. ... every time someone finished it I’d get a notification from that, but I can also see who hasn’t finished it.” (Team A, p.1)

There was a perception amongst members of Team A that use of video increased their **creativity**, in terms of stimulating thinking (Ic2) as explained here:

“That’s a bit more creative for us to really reflect, and we have to sit there and actually think about the lessons learnt entries we’ve done in the last two weeks, let’s think of some new ones and let’s really have a chance.” (Team A, p.13)

The final theme amongst the impacts identified was **emotional impacts**. The social network was described as “the heart of the project” (Team A, p.3) and the impacts identified were encouragement to participate in the project (Ie1), increased focus and professionalism (Ie2), as explained in these extracts:

“... adds a good pressure to me because it means that I’ve then got to step up my game and do the work because everyone else in the team has and otherwise, I’m going to be the one letting down the team, so there’s a good pressure to be able to keep driving that momentum forward and therefore we’ve been able to complete a large project in the way that we have because, it’s not a competition but you, you see it all the time don’t you and therefore you’re constantly aware right I need to get my work done...” (Team A, p.4)

“...with Podio, what I like about it is that when I’m on Podio I’m on the ball, it’s professional, and I’m thinking about what I need to do more.” (Team A, p.10)

Making a video increased the enjoyment of the team (Ie3):

“... I think we all quite enjoy our [making video] / yeah / That's the way we're making project management kind of fun as well.” (Team A, p.13)

Although these impacts were perceived to be beneficial, fear of letting the team down (Ie6) was identified as potentially a negative impact:

“I've then got to step up my game and do the work because everyone else in the team has and otherwise, I'm going to be the one letting down the team.” (Team A, p.4)

## Team B

Team B comprised four final year business students, made up of one female and three males, and all team members were in the age range 21-25. Their project was undertaken within the same framework at the university as Team A. The client for the project undertaken by Team B was the London head office of a department store chain selling own-brand and international fashion, beauty and homeware products.

A focus group meeting was conducted with Team B on the university campus in April 2013, prior to assessment of the project by the university. Three out of the four team members were present and the duration of the meeting was 1 hour 6 minutes. The team members considered themselves to be friends before commencing their final year project and three had collaborated on a project previously. None of the team had studied project management before commencing the final year project. The remainder of this section presents the findings from analysis of the data generated by analysis of the transcript of the meeting with Team B.

A range of social technologies were discussed by the team and four types were identified, as follows (see Glossary for definitions of terms):

Social network - Facebook

Shared workspace – DropBox, SkyDrive

Instant messaging and notifications – DropBox App, Facebook group

Video sharing (unspecified).

Team B used the wiki within the university's VLE because of the university requirement to do so. Here they considered the wiki to be like a web site, for one-way communication to an Internet audience, as explained here:

“I suppose we treat the wiki more like a web site don't we / yeah / it's kind of what would our web site be if we were a real consultancy company” (Team B, p.3).

A web site is not considered a social technology and this use of the wiki has not been included in the analysis. However, they also used the wiki as a type of shared workspace and this use has been classified as such.

Email was used by Team B for external communication and for some internal team communication. Within this work, email is not considered to be a social technology and therefore is not considered further here.

## Team B: factors influencing choice and use

Perceptions of three types of influences were identified for Team B - technological, team and task characteristics.

A **technological characteristic** that influenced the choice and use of the shared workspace was functionality in relation to document management (Ft6b), as shown here:

“I’ve made it [DropBox] like [?] everybody can view everything that’s in our folder. And you can also download it to you laptop and then it becomes a folder in your documents on your laptop, and then you don’t have to go online to access it at all, everything instantly downloads every time you connect the Internet, any updates. It’s really good.” (Team B, p.2)

Functionality in relation to notifications (Ft6f) was an influence on use of the social network, as shown:

“... we don’t use it for direct communication because there’s no way to notify like, to notify if somebody’s posted, we’d all have to check it with emails, whereas Facebook is instant to your phone.” (Team B, p.2)

Mobile access (Ft1) was a technological characteristic for the social network and the shared workspace, as explained:

“I definitely do access a lot of what we do on Facebook and on DropBox on our phones, maybe not so much DropBox but Facebook definitely I think / yeah / probably fifty percent of the time that I’m communicating on Facebook it’s kind of on the go and I’m just doing it on my phone, it’s just so easy it just pops up.” (Team B, p.3)

File size (Ft6d) also influenced use of the social network and shared workspace:

“... you can’t upload very big files on Facebook ...” (Team B, p.2)

“...if it’s a small file you can upload [to Facebook] so we’ve uploaded it onto DropBox and [use Facebook to] say it’s on DropBox.” (Team B, p.13)

Perception of ease of use (Ft2), reliability (Ft5) and security (Ft7) were factors influencing use of the shared workspace:

“... originally set up a Skydrive but I was getting frustrated with it cos I had a few problems, it wasn’t working very well so I was like we’re not using it anymore and did the DropBox instead ... Skydrive’s much more temperamental, it’s just not as solid software... with Skydrive you’ve always got to upload or download. Whereas with DropBox if you’ve got the actual thing downloaded, it’s just really simple.” (Team B, p.3)

“And the other thing about it is you’re worried about loosing work and if it’s stored in an online space there’s no worry about it disappearing so if it’s on DropBox you’re pretty much safe, no matter what happens you can get your work back if your laptop crashes or something like that (Team B, p.4)

The support provided by the social network for a group of people to communicate and collaborate (Ft6e) was also identified as a technological characteristic influencing choice and use:

“... it [Facebook] was the main way we could discuss that as a group, as opposed to, so if you’re texting each other it’s only one person, whereas in a group you can actually collaborate.” (Team B, p.1)

The **team characteristics** that influenced use of the social network were - prior experience with the technology (Fm2), communications preference (Fm1), team size (Fm4), and social ties (Fm3), as identified in these extracts:

“...obviously we’re all kind of connected to Facebook like 24/7 with our phones and everyone’s on the Internet” (Team B, p.1)

“So now maybe if, maybe twenty [in a team] plus I suppose might get kind of a bit / you might struggle ...” (Team B, p.9)

“We’ve all been really good friends anyway from the beginning...” (Team B, p.11)

A **task characteristic** that influenced use of the social network was the nature of the task, specifically the level of discussion required (Fk1):

“... we do speak a lot via text and phone as well when it’s something that needs more explanation than just a quick post on Facebook we need to talk about it.” (Team B, p.12)

The size of the document involved (Fk2) was another task characteristic that influenced use of the shared workspace and the social network, as identified under technological characteristics.

### **Team B: how social media were used**

Three themes of activities involving social technologies were identified for Team B (the number of activities in each is shown in brackets):

- Engaging team members (6)
- Project work (3)
- Management activities (3).

Within the theme of **engaging team members**, Team B discussed use of the social network to help organise and support meetings (Ae1), and for keeping in contact (Ae8), as explained in these extracts respectively:

“... I'll post on it saying which booth we are and where we're meeting, what time / there's a lot of kind of organizing logistics of where and when we're gonna meeting and if someone's unavailable for whatever reason, there's a lot of that.” (Team B, p.7)

“... our Facebook activity correlates with our, how often we meet actually. / Which is quite strange [?] / we don't really use Facebook as a way of replacing the fact that we're not meeting for a week or something, because we're on holiday, or we're working on something else, um we use it as a way to complement the meetings we have and kind of fill in the gaps...” (Team B, p.8)

“... we kind of just kept in contact through the Facebook group.” (Team B, p.1)

The social network was also used for informal information sharing (Ae3), problem solving and discussion (Ae6):

“If someone has a query, they can post it to Facebook, they can tag somebody directly in it.” (Team B, p.10)

“...often like an issue might arise in the project, or, something that needs an idea or something, so we'd just put it out there and the group someone will just post a message and say we've got this problem we've got this opportunity what does everyone think and then everyone can, in their own time, just say y'know ah we can do this, we can open conversation whereas if you're on a phone call or a text or something, it's just not really as, as effective...” (Team B, p.1)

And for requesting and providing feedback (Ae4), as shown here:

“... kind of give feedback and things like that so it was really really useful. ... it's a great place, rather than him send the list to each of us, then us each send separate lists back, he can just write a post on Facebook saying these are the few things I think I've got left and we can just comment on it, say if there's anything / but if there's a big list there it won't go in the safe group because we have a DropBox, all like joined by us, so we'll just say oh we've put it in the DropBox, see it there and comment on the Facebook group what we think ...” (Team B, p.1-2)

In addition, the social network and videos were used for brainstorming and sharing ideas (Ae7):

“... every time we kind of see something in the online or something like a viral ad that we think is quite relevant, we just post it on there / I do a lot of that / [?] yeah I do a lot of that [laughter] / especially when we've got to, when we have to do a brainstorming session...” (Team B, p.7)



Three activities were identified within the theme of **project work** that involved the social network and shared workspace - storing (Aw1) and sharing information (Aw2), and sharing work (Aw3), as explained in these extracts:

“DropBox is really good, you can basically just go in and edit things very easily and re-upload it and things like that so if had like a working draft you can have it on DropBox.... I’ve made it like [?] everybody can view everything that’s in our folder. And you can also download it to you laptop and then it becomes a folder in your documents on your laptop, and then you don’t have to go online to access it at all, everything instantly downloads every time you connect the Internet, any updates. It’s really good.” (Team B, p.2)

“...we even kind of you can share documents through Facebook” (Team B, p.1)

“... if people are doing work it’s like can you proof read this or can you do this bit, can you send me this bit over [using Facebook] ...” (Team B, p.8)

The project **management activities** that involved the social network identified by Team B were reporting on progress (Am3) and assigning tasks (Am1), as explained here:

“... he can just write a post on Facebook saying these are the few things I think I’ve got left and we can just comment on it...” (Team B, p.2)

“... Facebook it’ll just kind of be like can you get this done over the week end, can you get this done over the rest of the week” (Team B, p.5-6)

Changes were notified and discussed (Am6) over the social network, and the shared workspace used to share changes to documents (Am6). A change log was maintained on the wiki and in this way the wiki was used as an extension to the shared workspace, as explained in these extracts:

“I think that’s the main thing that we used like Facebook for, like over, like either texting or something, because like often like an issue might arise in the project, or, something that needs an idea or something, so we’d just put it out there” (Team B, p.1)

“That’s the good thing about it [DropBox], it kind of synchronizes everytime you turn on your laptop and therefore you don’t even need Internet because as long as you’ve had Internet for a period and it’s downloaded everything, then you can just go on and use it and it’ll upload it the next time you have Internet it will make it available to everybody else.” (Team B, p.2)

Finally, the impacts and consequences of using social technologies for managing a project were identified for Team B.

## Team B: impacts and benefits

Team members discussed their perceptions of a range of impacts and benefits of using social technologies, and seven themes were identified (the number of impacts in each is shown in brackets):

- Efficiency benefits (2)
- Quality of work (1)
- Information management impacts (3)
- Flexibility (3)
- Transparency (1)
- Creativity (1)
- Emotional impacts (3).

Team B commented that use of the social network involved little effort, and use of the shared workspace was easy (Ie1), and these comments have been interpreted in terms of **efficiency**:

“we go on Facebook a lot because of our group stuff but also you are on Facebook a little bit of the time anyway so it doesn’t seem much effort.” (Team B, p.8)

“DropBox is really good, you can basically just go in and edit things very easily and re-upload it and things like that so if had like a working draft you can have it on DropBox.” (Team B, p. 2)

However, Team B also identified ways in which the social network had a negative impact on efficiency (Is5):

“... just the way that it can hinder you is the way it’s just a bit more kind of um spread out and less concise ...” (Team B, p.5).

Use of the social network had an impact on the **quality of work** by facilitating feedback and encouraging collaboration (Iq1):

“you can actually collaborate and kind of give feedback “ (Team B, p.1)

“It’s [informality] a help in terms of, in collaborating and in the form of discussion, it’s definitely a help in terms of that...” (Team B, p.5)

In terms of **information management**, use of the social network and notifications facilitated sharing of informal information (Im5), as shown in the extract above, and rapid sharing of information (Im3), as indicated below:

“I guess it’s the immediacy thing. If someone has a query, they can post it to Facebook, they can tag somebody directly in it. If there’s something they want to post to directly and then people can reply very quickly. (Team B, p.10)

Team B also identified that use of the social network resulted in information going unrecorded (Im6):

“... actually it's not particularly formal and a lot of stuff goes kind of unregistered and unrecorded and things like that which is probably one of the downfalls of it” (Team B, p.5)

**Flexibility** was identified as an impact of using the shared workspace and social network; enabling team members to work in their own time (If1) and in any location (If2):

“You can access it [DropBox] from anywhere by logging online and then everything that you've got in there comes up.” (Team B, p.2)

“... someone can kind of respond in their own time [on Facebook].” (Team B, p.8)

The social network and notifications contributed to flexibility by enabling tasks to be assigned in response to change (If3), as explained here:

“if something pops up, outside of a meeting, that we kind of feel like we need to get done straight away, you might not, you might, cos it's quite informal we'll feel like oh we'll just put that task up there and see who's got time to kind of do that before the next meeting” (Team B, p.6)

Perceptions of **transparency** and accountability (It3) were associated with use of the social network, as explained here:

“... there's kind of no excuse as to why you've not replied, because you've read it and you've been on Facebook. / A degree of accountability as well like, you can't say oh no I didn't see that ...” (Team B, p.10)

There was a perception amongst members of Team B that use of the social network, to share links including videos, contributed to **creativity** on their project (Ic1), as explained here:

“I think as well I quite often like will share videos and stuff like off the back of this obviously like quite a large element of our project is a creative element, we've got to kind of create like this brand y'know every time we kind of see something in the online or something like a viral ad that we think is quite relevant, we just post it on there.” (Team B, p.7)

Lastly, the **emotional impacts** were identified. Team B attributed feeling engaged with the project (Ie2), and connected to the team (Ie4), to use of the social network, as explained in these extracts:

“I can’t think of any ways it’s affecting it negatively, cos it definitely keeps us much more engaged with the project, definitely keeps us much more kind of on the ball with the project ...” (Team B, p.10)

“... we’re all kind of connected to Facebook like 24/7 with our phones and everyone’s on the Internet, so it’s really just like, gives us the opportunity to, kind of constantly be connected like.” (Team B, p.1)

Team B also discussed the potential for use of the social network to cause “overload” (Ie5), but not that this is seen as a problem:

“... overload rather than just having here are our set tasks and here’s how long they should take, here’s how long we’ve got budgeted for them, on Facebook it’ll just kind of be like can you get this done over the week end ... it hasn’t ever caused a problem...” (Team B, p.5-6)

Pressure to work was also discussed. Constant communication was identified by the team and, although they considered the impact on the project to be positive (Ie1), they were also aware of the potential for this to have a detrimental impact on their wellbeing (Ie5), as explained in this extract:

“People are posting queries at like one in the morning like on things that just pop into your head and / literally it just comes into your head and you whack it onto the group ... [Interviewer: has that got positives and minuses?] Yeah, it has, because some of these things can wait. It’s not so immediate but once it’s thrown out there it’s it’s too late, everyone’s thinking about it [?] there’s no break, it means that there is never a holiday because people are always posting something on it. / I think the way you can look at things like that, in terms of our project it’s probably a positive because it does mean that we have this constant communication and we constantly improve and get things done. But maybe in terms of our emotional welfare it’s not that good [laughter] / it’s the same thing with mobile phones though, because now if you have something to say you ring somebody but before you had to write a letter and wait a week. Now, everything’s just a, everything’s an emergency.” (Team B, p.6)

### Summary of stage one findings

The data generated from the interviews with Teams A and B was compared and the findings were grouped into categories and types, and codes for each were added. All data mentioned by both teams or just one team was included. The interviews were unstructured and there was no questioning to uncover perceptions of specific categories or types. Therefore, the omission of a specific type or category by one team could mean that it did not apply, or was not considered important, but there could be other reasons why it was not mentioned that are unknown to the interviewer. Both teams' experiences are valid for this research: the similarities and differences are identified below and illustrated in Tables 4.1 to 4.4.

Six types of social technology were identified in the pilot, as summarized in Table 4.1, and four of the six types were used by both teams. The functionality of specific technology blurs the distinction between the types to some extent. The functionality of one application may include elements typically associated with a different type. For example, social networks provide capabilities for setting up a group and then allowing instant messaging of the group, sometimes called group chat. Some social networks provide a shared workspace. A shared workspace may have messaging capabilities and, if set up to do so, will automatically notify users when documents are uploaded or changed. Similarly, social networks can be configured to send notifications when new information is posted to the network. Online meeting software often includes messaging facilities and a shared workspace. Team A highlighted the overlap between types of technology when they likened the functionality of the application for the social network they were using (Podio App) to text messaging (i.e. instant messaging):

“... we have the Podio App as well, it would be almost like sending a text message anyway as I'd get a notification when anything changes on there” (Team A, p.1)

Table 4.1 Types of social technology used (pilot)

<b>Social technology</b>	<b>Team A</b>	<b>Team B</b>	<b>Code</b>
Social network	Facebook, Podio/Podio App	Facebook	SN
Shared workspace	GoogleDocs, DropBox, wiki	DropBox, SkyDrive	SW
Instant messaging & notifications	Podio App, GoogleDocs	DropBox App, Facebook group	IM
Online meetings	Skype		OM
Video create & share	YouTube	Video sharing (unspecified)	VI
Micro blogs	Twitter		MB

Eighteen factors influencing the choice and use of social technologies were identified in three categories, and both teams discussed a range of factors in all three categories. Six characteristics of the technology were identified and the characteristic of functionality was further divided into six types. Team A identified eight technological characteristics, and Team B seven characteristics, and four were identified by both. Four team characteristics were identified by Team A and three of these were also identified by Team B. Two task characteristics were identified by both teams. All the influencing factors have been mapped against the technology types, as shown in Table 4.2.

Table 4.2 Factors influencing choice and use (pilot)

Code	Technological characteristics	Technologies					
		SN	SW	IM	OM	VI	MB
Ft1	Accessible on mobile phone/network	AB	B	AB			
Ft2	Ease and speed of use	A	AB	A			
Ft3	Degree of customisation	A	A	A			
Ft4	Cost	A	A	A			
Ft5	Reliability		B				
Ft6a	Functionality – support for project management	A		A			
Ft6b	Functionality – document management		B				
Ft6c	Functionality – synchronous document editing		A				
Ft6d	Functionality – file size and formats supported	AB	AB				
Ft6e	Functionality – support for discussions	AB		AB			
Ft6f	Functionality – notifications	AB	B	AB			
Ft7	Security		B				
	<b>Team characteristics</b>						
Fm1	Communications preferences	AB		AB			
Fm2	Prior technology experience	AB		AB			
Fm3	Social ties	AB		AB			
Fm4	Team size	B		B			
	<b>Task characteristics</b>						
Fk1	Extent of conversation required	AB		AB			
Fk2	Size/format of file/s involved	AB	AB				

Activities where social technologies were deployed were grouped into four categories and both teams identified activities in three of these: engagement, project work and management. Only Team A identified activities that were classified as communication across the project boundary. All activities have been mapped against the technology types, as illustrated in Table 4.3.

Table 4.3 How social technologies were used (pilot)

Code	Activities	Technologies					
		SN	SW	IM	OM	VI	MB
	<b>Engagement activities</b>						
Ae1	Organising and support for meetings	AB	A	AB			
Ae2	Conducting meetings				A		
Ae3	Informal information sharing	AB		AB			
Ae4	Requesting and providing feedback	AB		AB			
Ae5	Reminders and prompts	A		A			
Ae6	Solving problems and discussion	B		B			
Ae7	Brainstorming and sharing ideas	B		B		B	
Ae8	Keeping in contact	AB		AB			
	<b>Project work</b>						
Aw1	Storing information	A	AB				
Aw2	Sharing information	AB	AB	AB			
Aw3	Sharing work	AB	AB	AB			
	<b>Management activities</b>						
Am1	Assigning tasks and recording allocation	AB		AB			
Am2	Checking work progress	A		A			
Am3	Reporting task status	AB		AB			
Am4	Decision making	A		A			
Am5	Project diary					A	
Am6	Change management	AB	AB	AB			
Am7	Capturing lessons learned					A	
	<b>Communication across the boundary</b>						
Ab1	Distributing information externally					A	A
Ab2	Gathering external information						A

Twenty six impacts and benefits of using social technologies in projects were identified and grouped into seven categories and both teams identified impacts in all seven categories. All impacts and benefits have been mapped against the technology types, as illustrated in Table 4.4.

Table 4.4 Impacts and benefits (pilot)

Code		Technologies					
		SN	SW	IM	OM	VI	MB
	<b>Efficiency impacts</b>						
Is1	+Saves time / immediacy / easy to use	AB	AB	AB			A
Is2	+Reduces need to meet physically	A		A			
Is3	+Synchronous document editing		A				
Is4	+Driving project forward	A		A			
Is5	-Less concise	B		B			
	<b>Quality of work</b>						
Iq1	+Feedback improves quality	AB		AB			
	<b>Information management</b>						
Im1	+Eliminates need to send documents		A				
Im2	+Easier information sharing						A
Im3	+Faster information sharing	B		B			
Im4	+Saves duplication		A				
Im5	+Facilitates informal information sharing	AB		AB			
Im6	-Information loss	B		B			
	<b>Flexibility</b>						
If1	+Ability to work in own time	AB	AB	AB			
If2	+Ability to work at any location	AB	AB	AB			
If3	+Dynamic task allocation	AB		AB			
	<b>Transparency</b>						
It1	+All have the same information / flattens the structure	A	A	A			
It2	+Visibility of work and status	A		A			
It3	+Accountability	B		B			
	<b>Creativity</b>						
Ic1	+Facilitates sharing of ideas	B		B		B	
Ic2	+Stimulates thinking					A	
	<b>Emotional impacts</b>						
Ie1	+Encourages participation (motivation to work)	A		A			
Ie2	+Increases focus / engagement	AB		AB			
Ie3	+Enjoyment					A	
Ie4	+Feeling connected	B		B			
Ie5	-Fear of overload	B		B			
Ie6	-Fear of letting team down	A		A			

The findings from the pilot stage were compared with the conceptual framework and an overview is shown in Fig. 4.1. These findings are aggregated with the findings from later stages at the end of this chapter, and are discussed in depth in Chapter 5. At this stage, the findings from the pilot provided a warrant for continuation of the research.



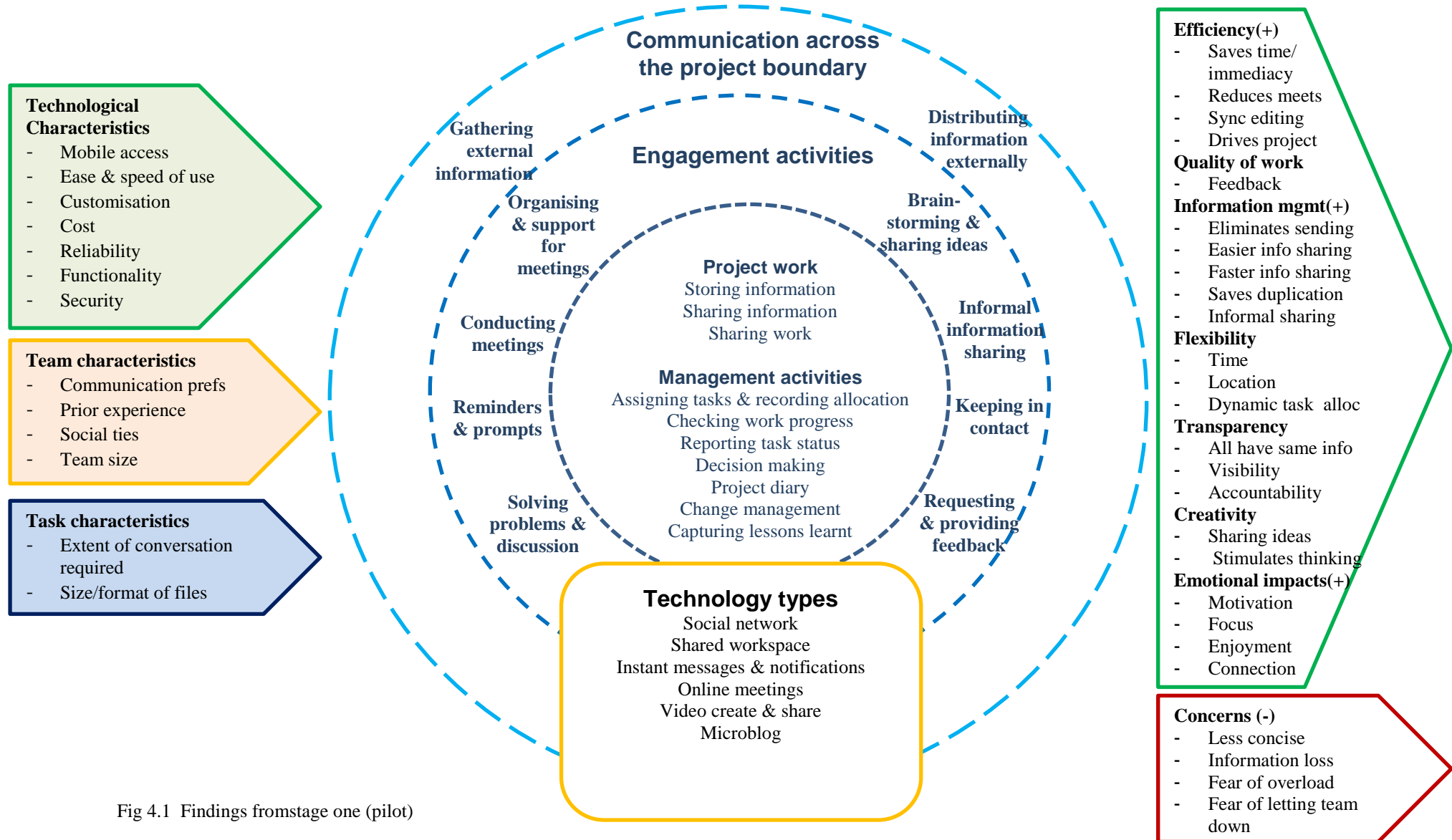


Fig 4.1 Findings fromstage one (pilot)

### 4.3 Stage two findings

Data was collected in stage two between March and June 2015. The findings are grouped into three types:

- i. Three team interviews were conducted with teams of final year business students (teams M, S and V), similar to those in the pilot (n=9).
- ii. Three individual interviews with final year business students discussing their final year team projects (individuals N, T and Y). The projects discussed were similar to those discussed by teams M, S and V (n=3).
- iii. Six interviews with students from a range of different disciplines (individuals C, D, E, F, P, U) discussing their participation and management of projects involving teams of three or more (n=6).

All the interviews were recorded, transcribed and analysed as described in Chapter 3. The data generated from all the interviews in stage two are presented in this section. The interviews are presented in alphabetic sequence within each of the types listed above (i, ii and iii). For each interview, the contextual data is presented first; followed by analysis of the social media used, how they were used and then perceptions of the impacts. The data from the interviews are then synthesised and a summary is presented at the end of this section.

## Team M

Team M comprised three male final year business students undertaking a consultancy project as part of their course. All team members were in the age range 21-25. Two team members lived in the same house, facilitating communication between them, and the third member lived away. The researcher, as a member of the teaching team on their course, was known to all members of the team. The team self-selected to participate in this research by responding to an invitation sent to all business students undertaking team projects.

The team discussed their experience of using social technologies on both their final year project and while managing projects on placement.

Team M used the social network Facebook, Facebook chat (IM) and created a Facebook group, to manage their project (SN). Both DropBox and GoogleDocs were used as shared workspaces (SW). As well as messaging and notifications (IM) from the social network and shared workspaces, team members also used the instant messaging capability within a computer game (IM) to communicate when they were playing at the same time, as explained here:

“Quite often me and [name] would play the same games which actually makes it easier [?] so me and my group would say something and I would just send [name] a message saying oh this is what's going to happen...” (Team M, p.2)

One technological characteristic that influenced choice and use of the social network, notifications and shared workspace was accessibility over the mobile phone (Ft1):

“... Facebook up in the background, um, and it means that if someone gives me a notification it will come through. I've got it on my phone so I get notifications through on my phone and I can view any documents or files, or anything that's being moved around, on my phone.” (Team M, p.4)

Technological characteristics that influenced their choice and use of the social network and shared workspace were perceptions of ease of use (Ft2), security offered (Ft7) and synchronous editing capability (Ft6c), as explained here:

“... any online storage, the ease of use it brings ... unfortunately one member of the team um really was not too keen on using DropBox. [?] he has a bit of a thing against using cloud um he said / [?] / it's not so safe, not the best tool to use and he'd rather rely on Facebook but, that caused a few issues at times, when me and [name] were uploading documents to DropBox all the time and sharing through that, um whereas we'd have to tailor our approach slightly to / even something like Googledocs was very useful for our cloud storage because its something where everyone can actually edit the

same document at the same time ... I would never use Facebook for anything that was confidential ...” (Team M, p.1)

Security requirements of the organisation (new Fo1) and the task (Fk3) were characteristics recognised by Team M that had not been identified in the pilot:

“... a lot of the information we use is relatively sensitive, either company secure or, or with higher security clearances, so it can't be covered with social media.” (Team M, p.4)

Another new characteristic of the organisation recognised by Team M was the internal systems in use (new Fo2):

“... regarding security always we try and use the internal systems of whatever company we're working at.” (Team M, p.2)

Preference of individual team members (Fm1) and prior experience (Fm2) were identified as team characteristics that influenced use of the social network and shared workspace as shown here:

“... really was not too keen on using DropBox. [?] he has a bit of a thing against using cloud ... so probably me and [name] are much more well versed in using like tools, not necessarily just social media tools but all sorts, like um computer based tools um, which means that we're more comfortable and more ready to use them, um, possibly.” (Team M, p.1)

Other team characteristics identified were team size (Fm4), social ties (Fm3), and age of the team (new Fm5), as shown in these extracts respectively:

“... in a team of three it's really good because you don't have the absolute onslaught of perhaps a large group where you could have multiple things being uploaded, it could get a bit messy ... if you put three people in a group and you just chat to each other, it's not going to get too confusing.” (Team M, p.2)

“... because we're, um social friends as well as, work, work, work acquaintances.” (Team M, p.2)

“... it is again the most efficient way to reach people of our age group and generation because it's something we all have access to, and are all um able to look at quickly and easily and um so whether its social or, or mainstream stuff ...” (Team M, p.5)

Team M used social technologies for engaging team members by organizing meetings (Ae1), informal information sharing (Ae3), keeping in contact (Ae8), and discussion (Ae6), as shown here:

“... we can have updates whenever someone posts some information up there, or whenever we have some meeting we have to attend.” (Team M, p.1)

“...we were in so much contact, it was constantly, like / yeah / you’re going on about the project.” (Team M, p.3)

“I mean it makes it very easy for us to discuss work at any time on there ...” (Team M, p.2)

For project work, the shared workspaces were used for storing information , sharing information (Aw1, Aw2) and sharing work (Aw3), as shown here:

“uploading documents to DropBox all the time and sharing through that, um whereas we’d have to tailor our approach slightly to / even something like Googledocs was very useful for our cloud storage because its something where everyone can actually edit the same document at the same time, which we thought was fantastic because obviously if you have something that we’re all working on together as a team we can go oh look someone’s updating this area I can update this area of the project document they can update this bit at the same time.” (Team M, p.1)

On placement, one of the team used the social network to access a wide range of people, thereby communicating across the project boundary (new Ab3), but when he assigned tasks he found that the work did not get done, as explained here:

“It gave us access to a wide range of people...” (Team M, p.4)

“I found that if I left anything on the social media for anyone to try and do, or complete, nothing got done...” (Team M, p.4)

The extract above also illustrates two impacts: extending information sharing (new Im7) and that tasks could be ignored (Is6).

Other impacts of using social technologies identified by Team M were in terms of efficiency (Is1) and increased focus on the project (Ie2), as explained here:

“It [Facebook] is very very useful, very quick, very efficient...” (Team M, p.4)

“... we can just go out and say like remember we’ve got er / we can’t mess around then guys because we’ve gotta do this. Er but we can have some time out here er because we’ve got free time.” (Team M, p.2)

The shared workspace enabled synchronous document editing (Is3):

“Googledocs was very useful for our cloud storage because it’s something where everyone can actually edit the same document at the same time...” (Team M, p.1)

An impact on information management – easy information sharing (Im2) – was identified:

“...the ease of use it brings [?] you don’t have to go on to Facebook [?] just go onto DropBox and share folders between each other.... uploading documents to DropBox all the time and sharing through that...” (Team M, p.1)

## Team S

Team S comprised three male final year business students undertaking a consultancy project as part of their course. All team members were in the age range 21-25. The researcher, as a member of the teaching team on their course, was known to all members of the team. The team self-selected to participate in this research by responding to an invitation sent to all business students undertaking team projects.

The team discussed their experience of using social technologies on both their final year project and while managing projects on placement.

Team S used the social network Facebook (SN), shared workspace DropBox (SW) and WhatsApp, an instant messaging service (IM), to manage their project. Also, one of the team used Microsoft Lync for hosting online meetings (OM) while on placement.

Access from mobile phone and computer (Ft1) was a technological characteristic that influenced choice of the social network and shared workspace:

“... it was instantly accessible to all of us because we just had a team DropBox account, um, that we all had logged in on our computers so no matter what we were doing we could just chuck files there. If it was a quick like can you just check these details we'd do it over Facebook um / And then any other communication was just via WhatsApp / pretty much any other communication was over WhatsApp because it's on your mobile phone, its an App that we all use like, I mean I use every day...” (Team S, p.1)

Cost (Ft4) and compatibility with equipment (new Ft8) were also identified as technological characteristics that influenced use of instant messaging:

“I use it every day pretty much / for texting / it's a free, efficient tool ... the best thing about it the iphone has it if it's iphone to iphone but not if it's to any other phone ...” (Team S, p.1)

Team characteristics identified by Team S were their social ties (Fm3), previous experience of working together (new Fm6) and the level of trust amongst them (Fm7), as explained here:

“... we're all friends... we've worked on projects together like ... the level of trust has been built up over the up and coming years really... “ (Team S, p.1)

A task characteristic identified was the nature of the task, specifically the extent of discussion required (Fk1):

“If it was a quick like can you just check these details we'd do it over Facebook...” (Team S, p.1)

Team S used instant messaging for engaging team members by organizing and supporting meetings (Ae1), informal information sharing (Ae3), sharing ideas (Ae7), keeping in contact (Ae8), and for reminders (Ae5), as explained here:

“... where we communicated via text, when meetings were, when d’you want to meet up.” (Team S, p.1)

“... when the design was done, they would send me an instant message saying done the designs, I would bang it on the agenda for next week and next week they would have a set amount of time that they can screen share the stand design...” (Team S, p.2)

“... after that meeting we’d just use WhatsApp and someone might have thought of something, ah god we need to do that as well, so we’d just send a quick message to saying ah k guys we need to do this...” (Team S, p.3)

“... ah I’ve just remembered this, but instead of having you know to ring someone up or send emails or do any of these, literally it was bang straight into the WhatsApp group.” (Team S, p.3)

“Like you just sort of bounce off each other anyway [?] ah yes, I forgot about that, and we could do this, and we could do that, so it’s just a great way to interact with people.” (Team S, p.3)

“... simple text checking up how’s everyone work going, reminds everyone...” (Team S, p.4)

The social network was used to request and provide feedback (Ae4):

“So Facebook was used to er, we set up a group on there as well, we used to send file over to people to check, and to send back, and to edit and just anything to do with that.” (Team S, p.1)

On placement, a team member used Lync to host meetings (Ae2).

For project work, a combination of the social network and the shared workspace were used for storing and sharing information (Aw1, Aw2), and the shared workspace was used for sharing work (Aw3):

“... for anything specific we use DropBox [?] so we had a DropBox account for all of our stuff, any files we created were just chucked straight onto DropBox. So if we didn’t have it through Facebook, it was instantly accessible to all of us because we just had a team DropBox account, um, that we all had logged in on our computers so no matter what we were doing we could just chuck files there...” (Team S, p.1)

Management activities involving instant messaging were assigning tasks (Am1), checking work progress (Am2) and managing change (Am6), as explained here:



“There’s so many little tasks that you do forget, about all the time, and you don’t think of until they arise, and not having to be face to face, not having to have that physical presence is great, because it’s just instant. And you can manage it so easily. ... whenever sort of a change did happen, you need to be like ah k how are you going to manage it and what are you going to do next.” (Team S, p.3)

For Team S, impacts of using instant messaging were identified in terms of efficiency, interpreted as saving time and immediacy (Is1), faster information sharing (Im3), and facilitating informal information sharing (Im5), as summarized here:

“...I knew that as soon as I’d sent it these two would have seen it and it was sorted out instantly ... it was integral to our project success . If we didn’t have WhatsApp we wouldn’t have been able to communicate anywhere near as efficiently, and um kind of organise and manage ourselves anywhere near as efficiently...” (Team S, p.3)

Flexibility impacts of the ability to work in their own time (If1), any location (If2) and dynamic task allocation (If3) were identified for use of the instant messenger:

“... instead of having you know to ring someone up or send emails or do any of these, literally it was bang straight into the WhatsApp group. I knew that as soon as I’d sent it these two would have seen it and it was sorted out instantly.... WhatsApp was the thing to do, it was just instant. Like I was all the way down in Cornwall and [name] was in Southampton and Bournemouth, and it was just a really easy accessible thing...” (Team S, p.3)

Use of the social network to request and provide feedback is likely to have an impact on the quality of work (Iq1), as identified above.

Transparency when sending information was highlighted by Team S and this has been interpreted increased accountability (It3):

“So you get a tick if it’s been delivered, um sent, two ticks if like they’ve like received it, and two ticks in blue if they’ve read it. So you can instantly see like who’s on WhatsApp and if we’re like worrying about oh who’s online when or like / have they seen it / I don’t know if they’ve done anything, so you can quickly see oh yeah ok it’s been delivered they haven’t seen it or oh yeah they’ve seen it or if they haven’t seen it and it’s not even been delivered you can give them a quick ring cos that’s the second quickest way.  
“ (Team S, p.1)

One emotional impact of using instant messenger was encouragement to participate in the project (Ie1):

“... also it adds, it adds an element that you kind of need str, not stress but pressure that you do need because in all projects you’re delivering something to someone...”

(Team S, p.4)

Team S also linked use of instant messenger (WhatsApp) and online meeting (Lync) with faster development of trust (new le7):

“I think our project went really well because as we’ve said before because like the trust between us we knew that when we assigned each other work, or when people had seen messages to do work, we know that we’d do it and to a standard we already know before. In first and second year obviously it’s basically a race to how quickly you can get that trust up, as to how successful your work’s gonna be. Because the quicker you can place trust in people, the quicker you can delegate work and one the less stressful time you’re gonna have cos you’re not going to have to do so much work, and also the work will be at a higher quality because people aren’t gonna be worrying about each other’s work they’ll just be focused on their own, and just smash it out. So any any tool to kind of er heighten or speed up that process of building trust with group members is um really important I feel...” (Team S, p.2-3)

## Team V

Team V comprised three male final year business students undertaking a consultancy project as part of their course. All team members were in the age range 21-25, and all lived in the same house for their final year, although one team member spent some time abroad during the project. The researcher, as a member of the teaching team on their course, was known to all members of the team. The team self-selected to participate in this research by responding to an invitation sent to all business students undertaking team projects.

The team discussed their experience of using social technologies on both their final year project and while managing projects on placement.

Team V used the social network Facebook (SN), instant messaging service WhatsApp (IM), and Skype for online meetings (OM) to manage their project. One team member discussed his experience on placement of using the social network LinkedIn (SN) and a development web site used as a shared workspace (SW).

Technological characteristics that influenced their choice and use of the social network and instant messenger were mobile phone access (Ft1) and speed of use (Ft2), as explained here:

“... its quite easy to just get your phone out and type a message on WhatsApp.” (Team V, p.1)

“... more of document orientated approach, definitely Facebook. If you're looking for like a speedy quick couple of lines, I'll send you this, then WhatsApp is brilliant for that ....” (Team V, p.2)

The functional characteristics of instant messenger that influenced choice and use were the capability for group discussion (Ft6e) and notifications (Ft6f):

“You can set up a texting group as well, um, which I think runs over, well either 3G or 4G, um / but the good thing about WhatsApp / but we're all on WhatsApp anyway / is that you can see who's read it as well / yeah read receipts...” (Team V, p.2)

Perceptions of the security offered (Ft7) was another characteristic that influenced use of technologies:

“... sending emails, there was a lot of sensitivity around them, who can see what, what department can see what, because there's sort of conflicting interests, departments competing internally against one another as well ... social media just was not an option, we weren't even allowed to email people outside the project team...” (Team V, p.3)

A team characteristic that influenced use of instant messenger was prior experience (Fm2):

“... we’re all on WhatsApp anyway...” (Team V, p.2)

On placement, one team member identified personal preference (Fm1) as a factor influencing use of a social network, and age/generation (Fm5) influencing use of a shared workspace, as identified in these extracts respectively:

“... they did sort of push LinkedIn a lot. I personally didn’t because I prefer networking more face to face...” (Team V, p.3)

“But the younger generation definitely used it a lot more, and found it a lot more useful. ...” (Team V, p.4)

Requirement for security, as discussed above, were identified as a characteristic of the organisation (Fo1) that influenced use of a social network and instant messenger.

Team V used instant messenger for setting up meetings (Ae1), informal information sharing (Ae3), and keeping in contact (Ae8):

“... that group’s mainly used for setting up meetings, or, if you’ve thought of anything, like I dunno, like when [name] when he was away he’d maybe think of something so he’d get on the group quickly and I’ll trigger it, ... it’s kind of a quick way to get in contact with people” (Team V, p.1)

The social network was also used for keeping in contact (Ae8):

“So we used it [Facebook] basically, to contact each other...” (Team V, p.1)

For project work, the team used the social network for storing and sharing information (Aw1, Aw2) and for sharing work (Aw3), as shown here:

“upload any documents [to Facebook page] ... when [name]’s been out of the country, in which case so I’d do my bit and upload, or email, or put in on the Facebook page, [name]’d see that version and do his bit and save it as [name]’s version, and send it to [name], and [name] would do his bit and put it back up. And then we could all view the same document. “ (Team V, p.1)

Instant messaging also contributed to managing change (Am6):

“So I was notified every time something had changed from England.” (Team V, p.2)

A member of the team discussed use of a shared workspace for capturing and sharing learning from past projects (Am7):

“I worked in the development department and we had this development web site which was used to share past projects, to create sort of shared learning...” (Team V, p.3)

Team V also used the social network for communicating beyond the project boundary (Ab3) and gathering external information (Ab2):

“We also had our housemate [name] on it as well, he was also doing project management, as a sort of unbiased sort of fourth opinion.” (Team V, p.1)

Efficiency impacts in terms of fast access to the team were identified from the use of instant messaging and were coded as saves time/immediacy (Is1):

“... it's kind of a quick way to get in contact with people as opposed to logging onto Facebook, typing and all of that...” (Team V, p.1)

Social technologies enabled the team to work in their own time and location (If1, If2):

“...we also used it quite a lot when I was in Hong Kong. So over Easter, and Christmas, I went back to Hong Kong, and we used Skype, Facebook, er WhatsApp, to just get in contact with each other.” (Team V, p.1)

Use of instant messenger had an emotional impact in terms of focus on the project (Ie2), as explained here:

“... [WhatsApp] kept it kind of current in my life. So I was notified every time something had changed from England.” (Team V, p.2)

“... so I think that really helped us to er stay on point...” (Team V, p.3)

## Individual N

N was a final year business student talking about a consultancy project undertaken by a team of three female students, and her own experience on placement. N self-selected to participate in this research by responding to an invitation sent to all business students undertaking team projects.

N identified use of social network Facebook (SN), shared workspace DropBox (SW) and instant messaging (IM) to manage the project.

A technological and task characteristic that influenced use of the social network and shared workspace was the size and format of files involved (Ft6d):

“... our final presentation, was er too big to post on Facebook ... It was only y'know our final presentation, it had er um er movies in it...” (N, p.1)

A team characteristic that influenced use of the social network was social ties (Fm3):

“... yeah we were already friends ...” (N, p.3)

A task characteristic that influenced use of the social network was the extent of conversation required (Fk1):

“... if we had purely used Facebook to swap change documents I don't think it would have, it wouldn't have gone that well, because we needed to then meet up every now and then to discuss things, argue a bit...” (N, p.2)

The social network was used to organize meetings (Ae1), storing and sharing information (Aw1, Aw2), sharing work (Aw3):

“And that [Facebook] was for uploading documents, er or arranging meetings and things...on some er [?] platforms you can have multiple people er editing at once and then it sort of merges them altogether whereas on Facebook a couple of times we did end up having to kind of cut and paste bits in because we'd worked on them individually (N, p.1)

The social network was also used as a project diary (Am4) and for managing change (Am6):

“... everything we'd ever said to each other and thought about was on that group so if we forgot something we could just scroll back through and see what decision we made or what areas had changed things like that...” (N, p.2)

On placement she experienced use of instant messaging for informal information sharing (Ae3) and sharing information (Aw2):

“Um we had like massive groups set up on there [IM] where people were dropping files, adding questions...” (N, p.1)

Information management impacts identified by N were that use of the social network eliminated the need to send information (Im1) and that information was easy to find (new Im8):

“Storage was a massive thing because it meant we didn’t have to be constantly sending each other things via email.” (N, p.1)

“... I mean you can just search by er key words, so say for example I was looking for something to do with our Gantt chart. You just search Gantt and it would just bring up everything, so it was really easy to find things.” (N, p.2)

Flexibility in terms of the ability to work in their own time (If1) and location (If2) were identified as impacts of using the social network and shared workspace:

“... we’d kind of arrange to meet up at a certain like time, so sometimes someone’d have to leave and they could work on it individually at home. But also if people weren’t here, it meant it gave us the freedom that two of us could meet and someone could work on it independently. ... So it gave us a bit more freedom. ... it’s more it’s more flexible ...” (N, p.2)

## Individual T

T was a final year business student talking about a project undertaken by a mixed team of four students and another final year project. T self-selected to participate in this research by responding to an invitation sent to all business students undertaking team projects.

A Facebook group (SN, IM), and shared workspace GoogleDrive (SW) were used by T to manage projects.

Perceptions of ease of use (Ft2) and security (Ft7) were identified as characteristics of the technology that influenced choice and use of the social network:

“... we felt this was the easiest way ... it meant our work was kept private.” (T, p.1)

Personal preference (Fm1) and prior experience (Fm2) were identified as team characteristics that influenced choice of the shared workspace:

“Um, just because from recommendations from another person in the group, I'd say, um but I would probably have preferred to use Facebook, um, and then just comment when, that we're updating the presentation, um, just cos I think it's a bit, more what I'm, what I've been used to, working in a group.” (T, p.2)

Engaging team members involved use of the social network for organizing meetings (Ae1), informal information sharing (Ae3) and sharing ideas (Ae7):

“... coordinate meetings ... you can then get everyone's comments and input on when we're free ...” (T, p.1)

“... we'd just post up random stuff that we'd found that was funny to do with the case study, like pictures and things ...” (T, p.1)

“... we would just put on our ideas for what should be included...” (T, p.2)

The shared workspace was used for sharing work (Aw3) and the social network was used for recording task allocation (Am1):

“... on Google Drive ... sharing the presentation, but, personally I thought Google Drive was a bit more difficult when it came to the editing because, we had to keep sharing and re-sharing it...” (T, p.1)

“... who was doing what, that kind of thing, was done on Facebook. ... things we need to cover, or what to do, or what we needed to do in preparation for that meeting ...” (T, p.2)

T indicated that use of the social network had brought the team closer together, interpreted as feeling connected (Ie4):



“I think it kind of um brought us together more, er like in terms of relationships ... made us a bit closer, in like, a friendship kinda way, we got to know each other a little bit more ... in way it kind of took a bit more of the professional side out of it and put a bit more of a personal side.” (T, p.1)

A contribution to time management was identified by T, interpreted as an impact on efficiency in terms of saving time (Is1):

“... very beneficial from a ma, like a time management point of view ...” (T, p.2)

An emotional impact of using the social network identified by T was that using text-based communication encouraged emotional sensitivity (new Is8):

“... you can't really convey tone so ... it kind of forces you to think about how you communicate and what you write ... so you don't actually, kind of upset anyone...” (T, p.2)

## Individual Y

Y was a final year business student talking about a consultancy project undertaken by a team of three male students. Y self-selected to participate in this research by responding to an invitation sent to all business students undertaking team projects.

Y identified use of the social network Facebook (SN), shared workspace DropBox (SW) and instant messaging service WhatsApp (IM) to manage the project.

Characteristics of the technology that influence choice and use were cost (Ft4), mobile access (Ft1), notifications (Ft6f), and the size of documents supported (Ft6d):

“All of the social media platforms I've used I've not paid a penny for...” (Y, p.3)

“Obviously emails there's an element of when someone receives it and when they reply, whereas if it's on their phone, generally even people during the working day are on their phone at some point.” (Y, p.1-2)

“... WhatsApp bleeps straight on their phone, whereas if they've got their setting slightly different on Facebook it might take them some time to actually see the notification.” (Y, p.1)

“So if you send a text a normal text message you don't know if someone's read it or not.” (Y, p.3)

“It was a massive help especially due to the size of the documents. So obviously through Facebook you're actually limited by how much you can actually put onto Facebook.” (Y, p.1)

A team characteristic influencing choice of the shared workspace was prior experience (Fm2):

“DropBox because I was really familiar with it. ... the boys were also used to it” (Y, p.3)

Team size (Fm4) was a characteristic influencing use of the social technologies; experience of working together (Fm6) was identified as a factor for using instant messaging with the project client:

“... there was only three of us...” (Y, p.4)

“...our client was obviously my old manager it was easier I'd built up the rapport with him so I did have at times the ability to use WhatsApp.” (Y, p.1)

The social network was used to engage team members by organizing meetings (Ae1), keeping in contact (Ae8) and informal information sharing (Ae3):

“... the main post I put on Facebook um and then so are we meeting on next day at a certain time...” (Y, p.1)

“... communicated with each other...” (Y, p.1)

“... it was a case of me getting my phone out, or um, or going on Facebook, and they’re not formal forms of communication...” (Y, p.4)

The shared workspace was used to store and share information (Aw1, Aw2). The social network and the shared workspace were involved in sharing work (Aw3):

“... we actually managed the documentation of the project. ... everything in one place” (Y, p.1)

DropBox was primarily for the team. So there was working drafts on there, and there was different files.” Y, p.2)

“So we use DropBox when we’re together um, and we’d pull resources off there and save them back on but also at the same time if I went to [name] or [name] and said can you send me over this, they would then upload it to DropBox and I’d receive it.” (Y, p.2)

“... through Facebook and WhatsApp I’d then communicate with them saying ok I’m currently working on this and just leave the version as existing on DropBox...” (Y, p.2)

Management activities involving the social network were assigning tasks (Am1) and checking work progress (Am2):

“I had the main knowledge of deadlines, what we need to do, when we need to do it, so I then had to make sure that information was relayed straight back to the team. Um, so, it was important for me to say, to see whether or not they had seen what I’d said and um, whether they were going to act on it.” (Y, p.3)

“... you can chase people through social media quite quickly...” (Y, p.4)

Efficiency impacts were identified in relation to use of instant messaging and the social network. Time management was identified - interpreted as saving time (Is1), reducing the need to meet (Is2), and not missing deadlines - interpreted as driving the project forward (Is4):

“The whole management of the project was a little bit quicker.” (Y, p.1)

“... that was crucial from a time management perspective...” (Y, p.3)

“... without them [Facebook, phone, WhatsApp] it would’ve been, our project would’ve been a nightmare to run cos you’re then relying on face to face meetings, ... Efficiency wise it was crucial.” (Y, p.4)

“... you’re less likely to miss deadlines within the project because everyone’s up to date ...” (Y, p.4)

However, Y also suggested that the impact on efficiency could be negative through loss of formality (Is5):

“...you lose the element of formality in your project, a little ... at times, social media meant our conversations went off topic from necessarily the project, which I guess kind of counteracts, to an extent, the efficiency ...” (Y, p.4)

Easier information sharing (Im2) was identified as an impact for use of the shared workspace, and use of the social network and instant messaging meant that information was not missed (new Im9):

“... DropBox ... it just seemed easier, er um, there was just no confusion...” (Y, p.1)

“...cos I followed people up so much [on Facebook/WhatsApp] ... it led to us, no one missing any piece of information ...” (Y, p.4)

However, the risk of information loss (Im6) if the project team was larger was mentioned:

“I can imagine if you have a group of eight or nine, or a large scale project, um which to be fair was kind of applicable with a lot of the tools we used, but in this case social media, I think, then there’s the potential for information to kind of slip out of place.” (Y, p.4)

An impact on transparency was identified for use of the social network and instant messaging as all having the same information (It1):

“So I think it’s, it constantly means everyone’s updated. Er, everyone knows what they are doing, when they’re doing it, obviously why they are doing it, if you like.” (Y, p.4)

Emotional impacts identified by Y were on team dynamics and providing feedback on engagement, interpreted as encouraging participation (Ie1) and feeling connected (Ie4) respectively:

“... I can then see if they’ve actually read that message. Um, which is quite handy cos it just gives you a bit more insight into whether or not they’re actually, whether they’re ignoring your message or whether they just haven’t seen it yet. ... certainly added value for the dynamics of the team. In making sure there was constant interaction.” (Y, p.3)

## Individual C

C was a second year student studying Public Relations and had previously studied Computing. He self-selected to participate in this research by responding to an invitation sent to all students undertaking team projects.

C reported using Facebook (SN), Facebook chat (IM), Google Docs (SW) and Google Drive (SW) to manage projects.

Characteristics of the technology that influenced choice and use of the shared workspace were the capability to store information in one place and transfer between devices, interpreted as document management functionality (Ft6b), and compatibility across different technology platforms (Ft8), as explained here:

“Because content can be put in one place.” (C, p.1)

“... you can't transfer documents on your phone whereas on social media, if you're on a computer you can upload documents to it” (C, p.2)

“... you could use it across different platforms” (C, p.1)

A team characteristic that influenced choice and use of the social network and shared workspaces was team size (Fm4):

“... without the social media it would have been nigh on impossible to communicate, especially as the project manager, because, if you're looking at, yeah, you're trying to communicate across , y'know, there was six of us in the group ...” (C, p.1)

The social network was used to engage team members by organizing meetings (Ae1), keeping in contact (Ae8), and reminders (Ae5):

“...we kind of used social media, as a way of, of organizing meetings with one another... you could certainly communicate with one another ... I used it as a tool to like gently remind people that they need to um crack on with what they're doing ...” (C, p.1)

The shared workspaces were used for storing and sharing information (Aw1, Aw2):

“... people would upload work ... then I could take the information, and er use it ...” (C, p.1)

Informal information sharing (Ae3) and checking work progress (Am2) involved the social network:

“... you need everyone to know what the other person is doing ... and they could know what was going on with one another's piece of work.” (C, p.1)

C also reported using the social network to contact people who were external to the project (Ab3) and gather external information (Ab2):

“... we also actually used it y’know for research purposes. So people would, their different friends would y’know, post out a survey and get people to fill it out.” (C, p.2)

## Individual D

D was a second year business student. He reflected on his role as the project manager for a team of 5 male students undertaking a project as part of their year two studies, a group project from the first year and his experience of using a social network in managing the rugby club. He self-selected to participate in this research by responding to an invitation sent to all business students undertaking team projects.

D had used the social network Facebook (SN) and Facebook chat (IM) to manage projects.

The technological characteristics that influenced choice and use of the social network were support for groups (Ft6e) and ease of use (Ft2):

“... the great advantage of Facebook is that you can set up groups ... easy to use for projects...” (D, p.1)

A team characteristic identified was that everyone already had the technology, coded as prior experience (Fm2):

“... it kind'o depends on what everyone else has...” (D, p.1)

The social network was used to organise meetings (Ae1), share work (Aw3), report task status (Am3), request and provide feedback (Ae4), as shown below. Setting deadlines was also mentioned and this has been interpreted (and coded) as assigning tasks (Am1):

“... it's [Facebook] great to organize meetings, ... you can upload the work you've done ... and we can post how far we've got over a certain time frame and y'know can set deadlines you want, individual deadlines for each other.... we could post the work that we've done which means everyone else could assess it look at it y'know give improvements ...” (D, p.1)

D also commented on use of the social network to contact external people (Ab3):

“... our Facebook page so, er, it enabled us to connect with a lot more people...” (D, p.3)

Two impacts of using the social network noted by D were easier information sharing (Im2) and the opportunity for feedback to improve the quality of work (Iq1):

“... so it makes it a lot easier [to share information], it increases the chance of success cos, as I said communication is important and everyone's gonna see I, and, um, there's less chance of mistakes in your work cos as I said you can have more eyes looking over it...” (D, p.2)

## Individual E

E was a second year student studying Public Relations. She self-selected to participate in this research by responding to an invitation sent to all students undertaking team projects.

E reported using the instant messaging service provided by Facebook chat (IM) to manage projects.

Characteristics of the technology that influenced choice and use of the instant messaging was ease of use for group communication (Ft2) and functionality for supporting group discussion (Ft6e):

“... Facebook chat’s the easiest way to communicate as a group ... so you can all see messages from each other.” (E, p.1).

The team characteristics identified were communications preferences (Fm1) and prior technology experience (Fm2), as she explained in these extracts:

“... most people are connected to Facebook most of the time ...” (E, p.1)

“... we’d have to find some other way to communicate if we didn’t use Facebook chat... we’re on Facebook all the time.” (E, p.2)

“Social chat Facebook chat is how we communicate, it just is.” (E, p.3)

Lack of prior technology experience (Fm2) was also identified as a reason why a shared workspace was not used:

“I’ve generally found that not everyone in a group is, is using GoogleDocs or knows how to use that as a shared workspace.” (E, p.1)

E described use of instant messaging to engage team members by organizing meetings (Ae1), and a series of activities that have been used to extend understanding of keeping in contact (Ae8) and include helping each other and getting a team together initially:

“... we generally use Facebook chat to organize meetings...” (E, p.1)

“...we tend to go away do our own thing, communicate everything through Facebook as kind of, er in quite a relaxed way...” (E, p.2)

“... if somebody’s finding one bit harder then we’ll chat in the group and see if we can help...” (E, p.2)

“So, it’s like an, it’s like an easy way of getting people together, in the first instance as well ... especially cos we’ve had a couple of people that we weren’t particularly familiar with, at first, in groups, um, so ... it’s simple to be able to go onto Facebook, find that person and put everyone in a group chat and organize from there.” (E, p.3)



She mentioned sharing work but this was interpreted as meaning the sharing of files (Aw2) rather than actually collaborating online, as explained here:

“... if one person’s working a particular element of a report um, once they’ve finished they save the report, and then attach the report to the um into the group as a message and send it to everybody else, so that we can all see um the file they’ve been working on...” (E, p.1)

Checking work progress (Am2) was identified as an activity involving instant messaging:

“... we touch base, every now and then, generally, check that everyone’s doing things.” (E, p.2)

Use of instant messaging was considered to positively impact efficiency in terms of organizing meetings, interpreted as saving time (Is1), and reducing the need to meet (Is2):

“...it certainly just makes things more efficient.” (E, p.2)

“... it’s massively helpful because, um it means that you don’t have to go individually to every group member and arrange when you’re going to meet up. Um, it means that you don’t have to meet up constantly in order to get work done.” (E, p.1)

Negative impacts on efficiency were identified as losing track of work (new Is7) and the potential for distraction (new Is8):

“... it can be quite easy to loose track of who’s edited which um kind of er, what’s the word, [pause] who’s got what bit of work on what document...” (E, p.1)

“... depends what you’re doing, um, as tools to organize people social media is very useful, but, it can be a distraction as well. (E, p.3)

An information impact identified for the use of instant messaging was that notifications were not missed (new Im9):

“...no one really misses notifications” (E, p.1)

Emotional impacts identified by E were of increased focus (Ie2), as explained in these two extracts:

“Um, I suppose using Facebook chat specifically makes us, more engaged, more often ... it kinda keeps people on track more, thinking about the project more.” (E, p.2)

“... it does put pressure on a little bit more but in a positive sense, in terms of like I said it keeps us thinking about the project, more.” (E, p.3)

## Individual F

F was a female student studying fashion.

She reported using the instant messaging provided by Facebook groups and conversations to manage projects (IM). Use of an image sharing web site, Pinterest (VI), was also discussed.

Ease of use (Ft2) was identified as a characteristic of the technology that influenced choice and use of the social network:

“It’s very, it’s quick and easy access to, to the rest of your group...” (F-U, p.2)

The type of project (new Fk4) was identified as a characteristic of the tasks involved that influenced choice and use of the image sharing web site:

“If it’s a very visual project, like for fashion say, er, we can collaborate with the Pinterest board...” (F-U, p.1)

Use of messaging for supporting meetings (Ae1), project diary (Am5), discussion (Ae6), and managing change (Am6) was identified:

“Pretty much, yeah, yeah, also it helps if you can at the end of a face to face meeting you can always summarise back into the chat, what you’ve gained from the meeting, and “... it’s always there, written down, so you can look back on your archives and you can remember...” (F-U, p.2)

If we need to discuss project ideas and if there’s any like change in your, a quick change which everyone needs to know about, you can easily just type it up on the group chat...” (F-U, p.1)

The image sharing web site was used for sharing ideas (Ae7):

“...we can collaborate with the Pinterest board, and um can all share ideas, and everyone can see what you’ve been posting ... you can comment, er, you can share boards...” (F-U, p.1)

An efficiency impact was identified for the immediacy (Is1) provided by use of the social network:

“It’s very, it’s quick and easy access to, to the rest of your group...” (F-U, p.2)

An impact on creativity was identified in terms of sharing ideas (Ic1), and on transparency in terms of all having the same information (It1), from using the web site:

“It’s good for, er, er, inspiration, and getting ideas, visually. (F-U, p.1)

“Well, you can kinda see where everyone’s coming from really, like what direction everyone’s thinking in...” (F-U, p.2)

## Individual P

P was a male student studying TV production.

P reported using Facebook (SN) and its messaging service (IM), along with OneDrive (SW) and DropBox (SW) to manage projects. He also discussed use of industry-specific social networks (SN) for recruiting project participants.

A characteristic of the technology and task that influenced choice and use of the shared workspace was the file size and format (Ft6d):

“... we transfer them ... we're working with big video files...” (P, p.1)

A team characteristic that influenced use of the social network was personal preference (Fm1):

“... depends on each group really, personally I prefer face to face meetings...” (P, p.1)

The social network and messaging were used to organize and support meetings (Ae1), for reminders (Ae5), informal information sharing (Ae3) and problem solving (Ae6), as explained here:

“... orgainse our face to face meetings, also you can then share um documents and stuff so like our running orders, schedule, script, all that kinda stuff.” (P, p.1)

“... to kinda remind people, so if we discuss something in a meeting, we can then just post it up on the Facebook group, like a summary of the meeting. (P, p.1)

“... you can comment on all the links and stuff so pretty much all discussions happen through the Facebook page....” (P, p.1-2)

“... questions are constantly asked and problems constantly being solved. “ (P, p.2)

The industry-specific social networks were used to contact external people (Ab3) and gathering external information (Ab2):

“I've used those for um, and we transfer them [?] really useful for sending ... big video files ...” (P, p.1)

“... there's loads o' different semi-professional and amateur and professional actors on there and then you kind of contact them, er get them to send through audition tapes and stuff...” (P, p.1)

The shared workspaces were also used to share information within the team and to distribute information externally (Ab1):

“... kind of sharing to contributors and stuff, if they want kind of final copies...” (P, p.2)

Convenience of using the shared workspaces was an efficiency impact identified (new Is9):

“...I’ve used those [OneDrive and DropBox] for, um, and we transfer them [?] really useful for sending kind of, cos obviously we’re working with big video files, that’s really handy to kinda send ... and sending videos in an email is just not a thing, urm so then we transfer, I think you can [only] send up to two gigs in one email...” (P, p.1)

Impacts identified for use of the social network and messaging were facilitating informal information sharing (Im5), the flexibility of dynamically allocating tasks (If1) and transparency of all having the same information (It1):

“Facebook groups you can kind of, there’s a constant connection so questions are constantly asked...” (P, p.2)

“... before we kind of fully organize Saturday, um, our producer said we need to find a pub, is anyone available on Thursday to recce this location, er and a couple of us commented saying um yeah that’s fine I’m free at ten or eleven or whatever, so then it’s yeah, you two go down...” (P, p.1)

“... then everyone can see it and everyone kinda knows what’s going on.” (P, p.2)

P identified the potential for tasks to be ignored (Is6):

“... it’s quite easy to hide behind the fact that it’s a group and you can kinda look at it or ignore that ...” (P, p.2)

Although the question of how willing people were to share their ideas over the social network was discussed, P considered that the social network did not have an impact:

“...it, kinda seems the same, like when, if someone’s vocal in a face to face meeting they’re vocal on Facebook ... I think people kind of, if people are kind of prepared to voice their opinions they don’t really mind what kind of medium it’s going through.” (P, p.2)

## Individual U

U was a female student studying communications and media.

She reported using Facebook groups (SN, IM) and conversations (IM) to manage projects.

The functionality of group discussions (Ft6e) and speed of use (Ft2) were characteristics of the technology identified that influenced choice and use of the social network:

“... we can message on there and pretty much responds straight away.” (F-U, p.1)

Uses of the social network were to keep in contact (Ae8), organizing meetings (Ae1), informal information sharing (Ae3), helping other team members (Ae8) and solving problems (Ae6):

“...use like Facebook to communicate, t' kinda organize things.” (F-U, p.1)

“... good for management to like set up meetings and things.” (F-U, p.3)

“... to organize meetings, and then, after the meetings, maybe like to just to clarify things, or just explain where to go next...” (F-U, p.1)

“...if you have any like little questions just to clear up, if you're trying to work on a bit of the project and then you come up with a problem, you can just quickly ask the group what shall I do about this, um, yeah, just to clarify things... you can just reply, and help them out...” (F-U, p.2)

“You don't have to wait until you next meet up to sort out the problems.” (F-U, p.2)

An efficiency impact of driving the project forward (Is4) was identified:

“... it helps it, because it like keeps the kind of project of moving ... cos you're messaging, them, like all the time, you're, you can um communicate with them, kit kind of keeps the ball rolling...” (F-U, p.2)

U also identified an impact on creativity from use of the social network in facilitating the sharing of ideas (Ic1):

“...if it sounded like a good idea, you might be more confident saying it on social media... easier to discuss your ideas...” (F-U, p.2)

An emotional impact of positive pressure, interpreted as encouragement to participate (Ie1), was also identified:

“... maybe a bit of pressure because it's there all the time, but then I think that's quite good in a way, because, like, it's always there to go back to, kin case you have problems and stuff.” (F-U, p.2)

#### 4.4 Summary and analysis of stage two findings

Six types of social technology were identified in stage two and these were the same as those identified in the pilot, as summarized in Table 4.5. Although three new technologies were identified, their use was classified within the codes from stage one: a computer game provided messaging facilities (IM) used by Team M, Pinterest - a social technology specifically for sharing images (IM) - was used by Individual F, and industry-specific social networks (SN) were identified by Individual P.

Table 4.5 Types of social technology used (stage 2)

	Teams			Individuals (4 <sup>th</sup> yr)			Individuals (2 <sup>nd</sup> yr)					
	M	S	V	D	N	T	Y	C	E	F	U	P
SN	•	•	•	•	•	•	•	•			•	•**
SW	•	•	•		•	•	•	•				•
IM	•*	•	•		•		•		•	•	•	
OM		•	•									
VI										•^		
MB												

\* messaging over Facebook and through a computer game      ^ Pinterest, image sharing

\*\* use of internal social network and industry-specific social networks

#### Factors influencing choice and use

Factors influencing the choice and use of the technology were identified in the same three categories found in the pilot - namely characteristics of the technology, team and task. Eight new factors were identified. One new technological characteristic (Ft8), three new characteristics of the team (Fm5, Fm6 and Fm7), and two new characteristics of the task (Fk3 and Fk4) were identified. One new category – organisational factors – and two new characteristics (Fo1 and Fo2) within this category were also identified. Twelve of the thirteen factors identified in the pilot were evident in stage two. All factors were mapped against the technology types, as shown in Table 4.6.

Table 4.6 Factors influencing choice and use (stage 2)

		<b>Technologies</b>					
	<b>Technological characteristics</b>	<b>SN</b>	<b>SW</b>	<b>IM</b>	<b>OM</b>	<b>VI</b>	<b>MB</b>
Ft1	Mobile access	MSV	MS	MSV Y			
Ft2	Ease and speed of use	MVD TU	M	VTE FU			
Ft3	Degree of customization						
Ft4	Cost	Y	Y	SY			
Ft5	Reliability						
Ft6a	Functionality – support for PM						
Ft6b	Functionality – document mgmt		C				
Ft6c	Functionality – sync doc editing		M				
Ft6d	Functionality – file size/formats	NY	NYP				
Ft6e	Functionality – group discussion	DU		DEU			
Ft6f	Functionality – notifications	Y		Y			
Ft7	Security offered	MVT	M	T			
Ft8	Compatibility across platforms		C	S			
	<b>Team characteristics</b>						
Fm1	Communications preferences	MVT P	M	TEP			
Fm2	Prior technology experience	MDT	MYE	VTD E			
Fm3	Social ties	MN		S			
Fm4	Team size	MYC		C			
Fm5	Age/generation	M	V				
Fm6	Experience of working together			SY			
Fm7	Trust			S			
	<b>Organisational characteristics</b>						
Fo1	Security requirements	MV	M	MV			
Fo2	Internal systems in use		M				
	<b>Task characteristics</b>						
Fk1	Extent of conversation required	SN		S			
Fk2	Size/format of file/s involved	NP	NP	P			
Fk3	Security requirements	M	M	M			
Fk4	Type of project/task					F	

## How social media were used

In stage two, activities were identified in the same four categories identified in the pilot. One new activity (Ab3) classified as communication across the project boundary was identified. Nineteen of the twenty activities identified in the pilot were evident in stage two. The activity not identified in stage two was Decision making (Am4). Possible reasons for this were not explored in the interviews but the interviews in stage two were much shorter than in the pilot and omissions could be due to a range of reasons unknown to the interviewer. All the activities were mapped against the technology types and are shown in Table 4.7.

Table 4.7 How social technologies were used (stage 2)

	Activities	Technologies					
		SN	SW	IM	OM	VI	MB
	<b>Engagement activities</b>						
Ae1	Organising/support for meetings	MDNT YCUP		SVTD EFUP			
Ae2	Conducting meetings				S		
Ae3	Informal information sharing	MTYC UP		SVNT UP			
Ae4	Requesting and providing feedback	SD		D			
Ae5	Reminders and prompts	P		SP			
Ae6	Solving problems and discussion	MUP		MFUP			
Ae7	Brainstorming and sharing ideas	T		ST		F	
Ae8	Keeping in contact / helping others	VYCE U		SVEU			
	<b>Project work</b>						
Aw1	Storing information	SVN	MSY				
Aw2	Sharing information	SVN	MSYP	NE			
Aw3	Sharing work	VDNY	MSTY	D			
	<b>Management activities</b>						
Am1	Assigning tasks and recording allocation	MDTY		ST			
Am2	Checking work progress	YC		SE			
Am3	Reporting task status	D		D			
Am4	Decision making						
Am5	Project diary	N		F			
Am6	Change management	N		SVF			
Am7	Capturing lessons learned		V				
	<b>Communication across the boundary</b>						
Ab1	Distributing information externally		P				
Ab2	Gathering external information	VCP					
Ab3	Contacting external people	MDCP					



### **Impacts and benefits**

Impacts and benefits were classified in seven categories during the pilot. Evidence of impacts in all seven categories was identified in stage two. Four new efficiency impacts were identified and, of these, one was perceived to be positive, convenience (Is9), and three were perceived to be negative: the possibility of tasks being ignored (Is6), losing track of work (Is7) and distracting (Is8). Three new information management impacts were identified and interpreted positively: extends information sharing (Im7), easy to find information (Im8) and that information was not missed (Im9). Two new positive emotional impacts were also identified: faster trust (Ie7) and encourages sensitivity (Is8). Of the twenty-six specific impacts identified in the pilot, evidence of twenty was found in stage two. All impacts and benefits were mapped against the technology types and are shown in Table 4.8.

The findings from stage two are combined with the findings from the pilot stage and are shown diagrammatically in Fig. 4.2.

Table 4.8 Impacts and benefits (stage 2)

		<b>Technologies</b>					
<b>Efficiency impacts</b>		<b>SN</b>	<b>SW</b>	<b>IM</b>	<b>OM</b>	<b>VI</b>	<b>MB</b>
Is1	+Saves time / immediacy	MTY		MSVT YEF			
Is2	+Reduces need to meet	Y		YE			
Is3	+Synchronous document editing		M				
Is4	+Driving project forward	YU		YU			
Is5	-Less concise/formal	Y		YE			
Is6	-Tasks ignored	MP		P			
Is7	-Losing track of work			E			
Is8	-Distracting			E			
Is9	+Convenient	P	P				
<b>Quality of work</b>							
Iq1	+Feedback improves quality	SD		D			
<b>Information management</b>							
Im1	+Eliminates need to send	N					
Im2	+Easier information sharing	MD	Y	D			
Im3	+Faster information sharing			S			
Im4	+Saves duplication						
Im5	+Facilitates informal info sharing	P		SP			
Im6	-Information loss	Y		Y			
Im7	+Extends information sharing	M					
Im8	+Easy to find information	N					
Im9	+Information not missed	Y		YE			
<b>Flexibility</b>							
If1	+Ability to work in own time	N	N	SV	V		
If2	+Ability to work at any location	N	N	SV	V		
If3	+Dynamic task allocation	P		SP			
<b>Transparency</b>							
It1	+All have the same information	YP		YP		F	
It2	+Visibility of work and status						
It3	+Accountability			S			
<b>Creativity</b>							
Ic1	+Facilitates sharing of ideas	U		U		F	
Ic2	+Stimulates thinking						
<b>Emotional impacts</b>							
Ie1	+Encourages participation (motivation to work)	YU		SUY			
Ie2	+Increases focus	M		MVE			
Ie3	+Enjoyment						
Ie4	+Feeling connected	Y		Y			
Ie5	-Fear of overload						
Ie6	-Fear of letting team down						
Ie7	+Faster trust			S	S		
Ie8	+Encourages sensitivity	T		T			

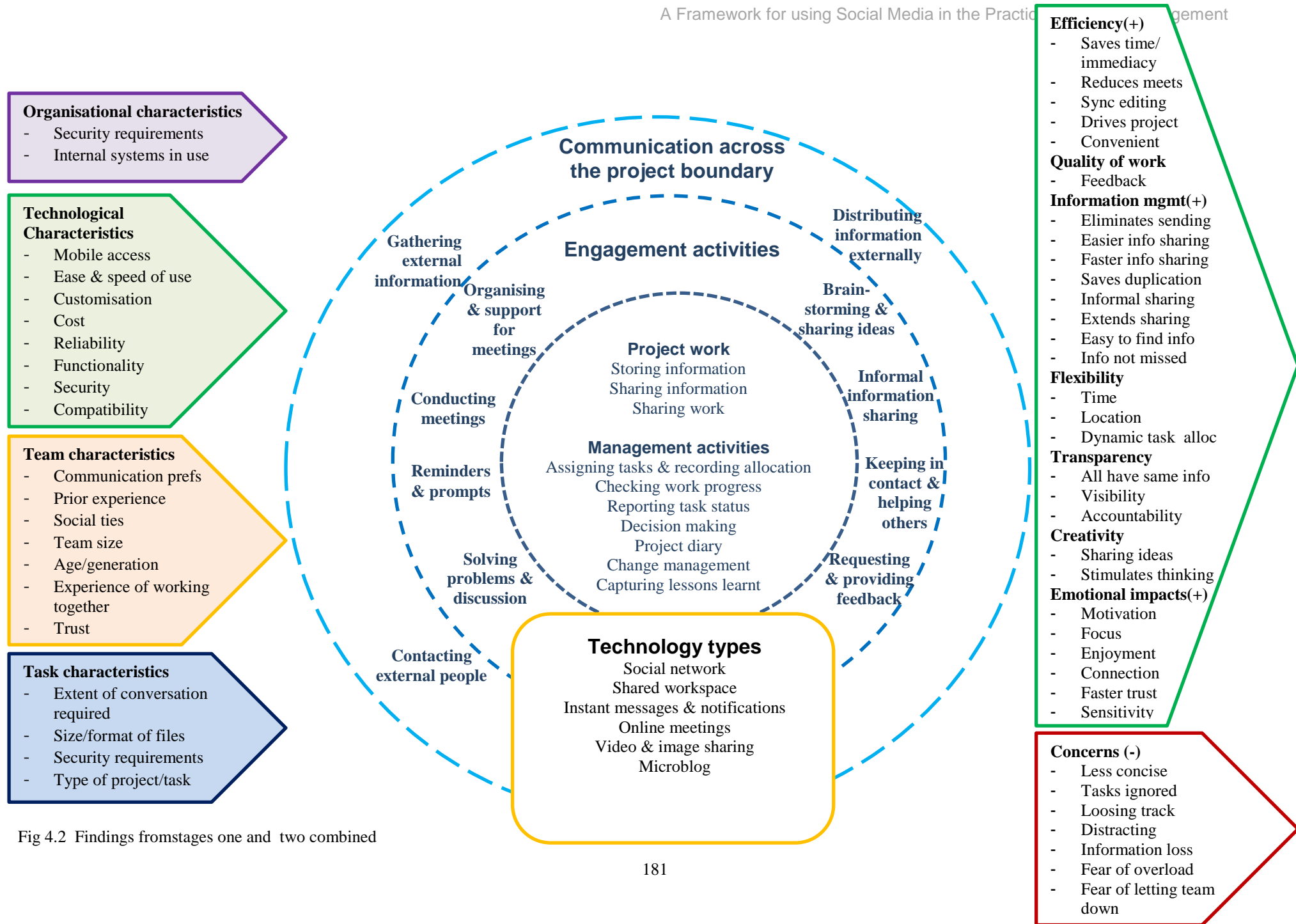


Fig 4.2 Findings from stages one and two combined

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## 4.5 Stage three findings

Data was collected for stage three in May and June 2015. In stage three participants were alumni who have been in the workplace for one or more years. They have more experience of projects beyond an HEI context and have learnt about organisational practices in a commercial setting.

Two interviews were conducted with alumni from the business studies course at the same university used in stages one and two. The meetings were recorded, transcribed, analysed and the data was coded as described in Chapter 3.

### Alumni group X

Group X comprised two alumni, both working for large organisations in the financial services sector. X1 was age 22-26, male, who has been working in the UK on the graduate programme of a large US bank for approximately two years. X2 was age 22-26, female, who joined the graduate scheme at a large London-based financial accounting firm and has worked there for approximately two years. Both individuals self-selected to participate in this research by responding to an invitation to members of the alumni panel for the business studies course. The focus group included brief discussion of their experience of using social technologies while at university, and then more detailed discussion of their workplace experiences.

At university, X1 discussed use of Facebook (SN), LinkedIn (SN) and WhatsApp (IM) to manage projects. X2 had also used Facebook (SN) and WhatsApp (IM).

At university, X1 indicated instant messaging was used for keeping in contact (Ae8) and informal information sharing (Ae3). An impact in terms of transparency was interpreted as accountability (It3), as explained:

“WhatsApp was what, how we managed our team work and our projects. Um you can share links, you can communicate to everyone, know when they’ve seen a message and um when they’re ignoring you. ... That proved the best method to get hold of everyone.” (X1, p.1)

Also at university, X1 mentioned use of a social network to contact external people (Ab3) and impacts of immediacy (Is1) but less formal (Is5) for internal communication :

“... used LinkedIn. So I joined relevant groups, that were relevant to my dissertation topic and posted questions in those groups, and came back frequently to check up who’d replied and what they’d replied. So, that way I had the background of the person replying, where they worked what kind of role they’re in, and that. So that contributed to that project in that way, as research.” (X1, p.3)

“Because people, are, usually, more responsive. That’s what it comes down to. Regardless of what er, method you use to contact people and share the bit of information, it comes down to the people. ... You message someone on Facebook at university, that could be social, that could be professional, but it’s never really seen as professional.” (X1, p.3)

At university, X2 indicated she used instant messaging for keeping in contact (Ae8), sharing information (Aw2), arranging and supporting meetings (Ae1), with a transparency impact of accountability (It3). She also discussed use of the social network to contact people externally (Ab3):

“Mine’s pretty much exactly the same. So the university project we used, we had a Facebook group that we used to communicate, but then we quickly changed to WhatsApp, again it was quicker to contact everyone, um and you can see if everyone’s read it, and know that they’ve got the information they need. We did a survey for our project so we put that on Facebook, like a link to it and try and get as many people involved as possible. From a project management perspective Facebook wasn’t used very much, um WhatsApp was only used to communicate to people and arrange when the next meeting was and what we needed to do prior to that meeting.” (X2, p.1)

In the workplace, X1 discussed using SharePoint (SW) for projects. X2 discussed use of a shared drive (SW) and an internal social network, Yammer (SN). No other types of social media were used, primarily due to organisational constraints, as discussed later in this section.

Both X1 and X2 highlighted characteristics of the organisation and the industry as key factors determining use of social technologies for managing projects, particularly security requirements (Fo1). A corollary is that perceptions of the security offered is a technological factor determining adoption and use (Ft7), as explained here:

“So we can use it socially, and we can put our company details and brief um career details on there. But we can’t, we’re very limited to what we can put on there, what we can use it for. Er, so, those Facebooks etcetera we wouldn’t use those for work. Um, we rely solely, or at least in my experience, on Outlook, emails, calendars, that kind of thing, um and calls, and that’s it.” (X1, p.1)

Both X1 and X2 discussed use of shared workspaces within their workplaces. X1 explained his use of a shared workspace to store information (Aw1) and sharing work (Aw3):

“The closest we get is SharePoint, but this is more of a information repository, rather than a moving document that goes with a project.” (X1, p.1)

“Going back to SharePoint, my first role in my, on the graduate program I’m on, um I utilized SharePoint, basically we needed to get some information from a stage three thousand people um so we created the document on SharePoint, provided that to two three thousand people and sent it to three thousand people. ... go in at the same time and update the fields required er so that was like a year long project and that was the sole moving document, resource, foundation of that project.” (X1, p.2)

X2 discussed use of a shared workspace to store information (Aw1):

“We have, our department has SharePoint but again it’s used as a sort of information repository, so you can go there and access um any training we’ve done, any internal operations manuals, risk documents, anything like that we can access there.” (X2, p.2)

X2 also discussed a social network in use internally (Fo2) and team size (Fm4) was a factor in determining use. She described use of the system for keeping in contact (Ae8), solving problems (Ae6) and contacting external people (Ab3):

“If it’s just between two of you then we’d probably just use email cos it’s easier, you can access it wherever you are. Um, we also have internal we have Yammer ... if you’ve got a problem you need to home in on someone’s expertise you can put a [Yammer] post into the whole of UK ... it’s a less formal way of the whole of the [company name] UK network keeping in contact.” (X2, p.2)

## Alumni group Z

Group Z comprised two alumni, both female, age 22-26, working on the graduate programme at the same large high-tech manufacturing company. Z1 had worked for the company for approximately one year, and Z2 for approximately 2 years. Both individuals self-selected to participate in this research by responding to an invitation to members of the alumni panel for the business studies course. The focus group discussion was about their use of social technologies for managing projects in their workplace.

Both Z1 and Z2 discussed using an internal VMWare corporate social network referred to as SSN (SN) and SharePoint (SW) in their workplace. Notification facilities offered by both SSN and SharePoint were discussed and have been coded as instant messaging (IM). No other types of social media were used.

A range of technological factors influencing the way the network was used were identified. Security (Ft7) was a technological factor as explained here:

“Dynamic in Google Docs is obviously the way to go, but I understand why [company name] as a large corporate couldn't host secure, confidential documents with someone like Google. So we have to have the SharePoint platform available, and I'm assuming it's hosted on some secure server somewhere so it's confidential.” (Z2, p.3)

Translation functionality (new Ft6g) was a new technological factor identified:

“I guess our main barrier in the use IT group where we're trying to approach all these new countries is translation requirements. Because SSN isn't like Facebook it doesn't have that button where you can just select translate. We have to get all of that translated, all of our content translated through a translation team if we're doing a big campaign. ... it's not possible on the platform we have specific privacy, sort, it comes from Germany and privacy laws.” (Z1, p.2)

Further technological factors of document management functionality (Ft6b), cost (Ft4) and file formats (Ft6d) were identified, as shown here respectively:

“SharePoint, because that has version control, so you'd be able to go in, like, a bit like Google Docs, um you'd be able to go in, open that document, edit it, save it back as a different version say one point three and then if [Z1 name] were to go into the document at the same time with version control enabled it would tell her that its read only copy because someone else is in there editing. So it's not as dynamic as Google Docs because it's not in real time, um, but you have this check in check out functionality and version control which allows us to do that.” (Z2, p.3)



“I’m assuming there’s something to do with cost implications there most likely. Um also it’s it’s not designed to be a document storage platform...” (Z2, p.3)

“... the SSN, um VM Ware can be enabled to have any documents uploaded to the social network but [company name]’ve chosen not to allow and to restrict to PDFs and images on the basis they don’t want it to be used as a storage platform...” (Z2, p.3)

The extract above also illustrates organisational policy as an influencing factor (Fo2) as an organisational factor influencing use. Rather than create a new factor for organisational policy, understanding of internal systems in use (Fo2) was extended. Management support or not (new Fo3) was identified as a new organisational factor, as explained here:

“So, for me there there’s absolutely er now an management push down the organisation especially in the UK to try and get the senior management team on there to be using it, to be leading by example. ...” (Z2, p.5)

“So we have a PM, the [company name] methodology that you have to hit certain milestones, ‘n quality gates etcetera along the process. But if there was some sort of direction from there, or instructions, people would be much more likely to buy into the idea of perhaps using SSN as a place to, to host their projects and talk about their projects. ” (Z2, p.7)

Four team characteristics influencing use were prior experience (Fm2), team size (Fm4), generation (Fm5), and communications preferences (Fm1), as illustrated below. Specifically, prior experience (Fm2) from personal use was identified and used to extend understanding of Fm2 as previously defined.

“... we have people that have never used social media outside of their, their professional working life and therefore they find it really scary, they’ve never touched it before personal or professional. Then we have people that have used it in their personal life and in work and they understand it and they pick it up really really easily. And then you get these people that sit in the middle that use it for their personal life but can’t relate it to their working world and they are the difficultest [sic] people to target, because they can’t translate how they use Facebook, Twitter, LinkedIn, and all those personal ones in the working world. They are our biggest challenge...” (Z2, p.6)

“I think when they said that they don’t like social media, or they don’t like um, SSN, it’s it’s just the I think it’s just the naivety they don’t know what it is yet. ” (Z1, p.6)

“I’d be less likely to set one up [a group on SSN] if there was a small amount of people” (Z2, p.5)

“Um, yes, so [Company name]’s social network’s our internal platform and I definitely think it benefits us being from the generation we’re from and having Facebook and all of that sort of thing, we’re very much familiar with it from the start, weren’t we, um, so I definitely think that benefits us.” (Z1, p.1)

“If you look at the demographic of [company name] in the UK it is factually correct to say that they are an average of white male thirty five engineers. That is our demographic as an average across the UK. So that comes with a cultural um difficulty, challenge, whatever you want to call it, in terms of using social media and what it’s there to do, and perhaps some of the um scary, the scary part of it.” (Z2, p.5)

In addition, two new team characteristics were identified: geographic distance (new Fm8) and job role (new Fm9), as explained here:

“If I’m sat in proximity to someone I’m working with maybe here in Poole I’d be less likely to set up a um er SSN group for that.” (Z2, p.5)

“... for me SSN is very much part of my job role, so my target is to increase the usership on the use IT group which in turn is to increase usership of SSN. So I’m constantly on it, I’m constantly posting.” (Z1, p.6)

“SSN isn’t for any everyone, depending on their job role like [Z1 name] said, it’s not only about preferences, it’s about their job role. If you’re doing an operational, day to day, um role, the likelihood of you having to use it if it weren’t for the end user support that we’re trying to promote through the tool, the likelihood of you using it is probably slightly less than you would be if you were maybe working in a slightly different role where you were doing a lot of project based temporary work where you were moving around and it was a bit more fluid.” (Z2, p.6)

The social network and shared workspace were used together to store information (Aw1), share formal and informal information (Aw2, Ae3), sharing work (Aw3), keeping in contact (Ae8), and supporting meetings (Ae1):

“... we’ll upload that onto the SSN so people can find that document, if required, or you’d convert it to a PDF and then share it that way” (Z2, p.3)

“So on SSN you can’t actually share documents, you can only file, share images, or PDFs [sic]. Um so we store everything on SharePoint and then if we’re sharing information on SSN we just insert the link.” (Z1, p.3)

“... if I was to update a document and I need, if I was working on that document with someone and I updated it, I’d more likely to let them know via SSN. Um, and use them

in conjunction with each other, rather than setting up sort of notifications but obviously that's a good, a good backup." (Z1, p.4)

"So we've used an SSN group to remain in contact with each other, share the documentation, um talk about meetings, talk about agenda items, ask about where things have gone missing or who's got them etcetera." (Z2, p.5)

The social network was used for obtaining feedback (Ae4), reporting task status (Am3), solving problems (Ae6) and managing change (Am6):

"So I use it on specific comms [sic] campaigns. So I might use um hash tags against comms campaigns and then search for those hash tags and then analyse sort of who's been commenting, who's been liking those posts ... that's to post top tips, and um end user support on everything to do with IT products and services." (Z1, p.1)

"... we can measure is the amount of likes and the amount of comments" (Z1, p.4)

"... team collaboration, we've got the UK graduate group on SSN so we all keep in touch through that on different events, um chatting. And then we've got team groups as well, so I'll stay in contact with my team on SSN." (Z1, p.1)

"... posting updates on projects you're working on, um, an example, a really good example, we had an unplanned issue, recently, with a home page not working, so one of my colleagues posted that on SSN, and I was able to see it straight away..." (Z1, p.1)

In addition, the social network was used for helping others (Ae8), contacting people externally (Ab3), gathering external information (Ab2) and distributing information externally (Ab1):

"... if I see someone's got an IT question that I could help with or it doesn't matter, a question or a concern, I could then post, as a normal user, or anyone can, to say hi [Z1 name] this is the answer or you could find the information here here's the link." (Z2, p.8)

"... it opens the door to an expert you might not even know is there ... it's still opening up the expertise to those two hundred and thirty people within IT that you might not talk to on a daily basis ." (Z1, p.2)

"So, the distance between people, y'know we really are now working in a virtualized organisation, and to be able to communicate with various different people from Spain, Madrid, Portugal, you name it, SSN enables us to do that in a much more virtual way, collaborative way, than we've ever had previously, um, we've never had that ability previously, and I think because we've gone a bit more global, a bit more regional, y'know things like social network have become even more important than they were previously." (Z2, p.2)

The impacts and benefits identified for the social network were immediacy (Is1), feeling connected (Ie4), not missing information (Im9) and transparency of all having the same information (It1):

“So I was able to react to that in a really quick time, whereas an email, I might have missed it...” (Z1, p.1)

“Um, so it’s about being able to help fellow colleagues as well and being responsible and being part of that family...” (Z2, p.8)

“It’s quick to get answers ... transparency, collaboration, and just an open environment really. Ownership, culture. ... it’s their responsibility to go and get that information from SSN, they can [?] go and pull that information themselves rather than just waiting for it to come to them. So they’re owning that content.” (Z1, p.8)

“And you can also follow people’s messages. So if someone’s um made a notification no matter who it is, if they’ve posted it on their er activity stream, you can right click on that and follow their, their message replies. So that’s quite good.” (Z1, p.4)

Dynamic task allocation (If3) was identified as a flexibility impact:

“... the beauty of SSN is that if that message was posted to a group where perhaps [Z1 name] hadn’t been able, available to pick it up, then if someone sent an email just to [Z1 name] that would have been in only [Z1 name]’s email box, so actually, if [Z1 name] wasn’t able to do it then maybe one of your colleagues was able to pick it up in that instance. ..., so I think that is a real benefit of that.” (Z2, p.1-2)

A negative impact identified was fear of making mistakes (Ie6):

“Y’know some people perceive it to be big brother, they’re watching them, they feel very uncomfortable, they feel unsure about where they’re posting things, and what does that mean, who’s watching them, are they going to get in trouble if they say the wrong thing, the language etcetera.” (Z2, p.5)

#### 4.6 Summary and analysis of stage three findings

Three types of social technology were identified in stage three: social networks (SN), shared workspace (SW) and instant messaging (IM) was explicitly identified by group X while undertaking projects at university. The specific technologies used are shown in Table 4.9.

Table 4.9 Types of social technology used (stage 3)

	Interview X				Interview Z	
	X1 <sup>1</sup>	X1 <sup>2</sup>	X2 <sup>1</sup>	X2 <sup>2</sup>	Z1 <sup>3</sup>	Z2 <sup>3</sup>
SN		Facebook LinkedIn	Yammer	Facebook	Company social network / VMWare	
SW	SharePoint		Shared drive		SharePoint	
IM		WhatsApp		WhatsApp	Notifications from social network and SharePoint	
OM						
VI						
MB						

<sup>1</sup> in the workplace <sup>2</sup> at university <sup>3</sup> both interviewees work in the same organisation

#### Factors influencing choice and use

Characteristics of the organisational context were highlighted in stage three, and one new characteristic – management support (Fo3) – was added to this category. One new technological characteristic was added within functionality (Ft6g), two new characteristics of the team (Fm8 and Fm9) were added and no task characteristics were mentioned. Eleven of the twenty one factors identified in stages one and two were evident in stage three. All factors were mapped against the technology types, as shown in Table 4.10.

Table 4.10 Factors influencing choice and use (stage 3)

	<b>Technological characteristics</b>	<b>Technologies</b>					
		<b>SN</b>	<b>SW</b>	<b>IM</b>	<b>OM</b>	<b>VI</b>	<b>MB</b>
Ft1	Mobile access						
Ft2	Ease and speed of use	X2 <sup>2</sup>		X2 <sup>2</sup>			
Ft3	Degree of customization						
Ft4	Cost	Z2 <sup>3</sup>					
Ft5	Reliability						
Ft6a	Functionality – support for PM						
Ft6b	Functionality – document mgmt	Z1 <sup>3</sup> Z2 <sup>3</sup>	Z1 <sup>3</sup> Z2 <sup>3</sup>				
Ft6c	Functionality – sync doc editing						
Ft6d	Functionality – file size/formats	Z2 <sup>3</sup>					
Ft6e	Functionality – group discussion						
Ft6f	Functionality – notifications		Z2 <sup>3</sup>				
Ft6g	Functionality - translation	Z1 <sup>3</sup>					
Ft7	Security / privacy offered	X1 <sup>1</sup> X2 <sup>1</sup> Z1 <sup>3</sup> Z2 <sup>3</sup>	X1 <sup>1</sup> X2 <sup>1</sup> Z2 <sup>3</sup>	X1 <sup>1</sup> X2 <sup>1</sup>	X1 <sup>1</sup> X2 <sup>1</sup>	X1 <sup>1</sup> X2 <sup>1</sup>	X1 <sup>1</sup> X2 <sup>1</sup>
Ft8	Compatibility with equipment						
	<b>Team characteristics</b>						
Fm1	Communications preferences	Z2 <sup>3</sup>		Z2 <sup>3</sup>			
Fm2	Prior technology experience incl personal use	Z1 <sup>3</sup> Z2 <sup>3</sup>					
Fm3	Social ties						
Fm4	Team size	X2 <sup>1</sup> Z2 <sup>3</sup>					
Fm5	Age / generation	Z1 <sup>3</sup>					
Fm6	Experience of working together						
Fm7	Trust						
Fm8	Geographic distance	Z2 <sup>3</sup>					
Fm9	Job role	Z2 <sup>3</sup>					
	<b>Organisational characteristics</b>						
Fo1	Security requirements / policy	X1 <sup>1</sup> X2 <sup>1</sup> Z1 <sup>3</sup>	X1 <sup>1</sup> X2 <sup>1</sup>	X1 <sup>1</sup> X2 <sup>1</sup>	X1 <sup>1</sup> X2 <sup>1</sup>	X1 <sup>1</sup> X2 <sup>1</sup>	X1 <sup>1</sup> X2 <sup>1</sup>
Fo2	Internal systems in use / policy	X2 <sup>1</sup> Z1 <sup>3</sup> Z2 <sup>3</sup>					
Fo3	Management support	Z2 <sup>3</sup> Z1 <sup>3</sup>					
	<b>Task characteristics</b>						
Fk1	Extent of conversation required						
Fk2	Size/format of file/s involved						
Fk3	Security requirements						
Fk4	Type of project/task						

### How social media were used

In stage three, activities were identified in the same four categories from the earlier stages. No new activities were identified. Eleven of the twenty one activities already identified were also evident in stage three. The organisational context may explain why some activities from stages one and two were not identified here, but there could be other reasons that were not uncovered during the interviews. The activities were mapped against the technology types and are shown in Table 4.11.

Table 4.11 How social technologies were used (stage 3)

	Activities	Technologies					
		SN	SW	IM	OM	VI	MB
	<b>Engagement activities</b>						
Ae1	Organising/support for meetings	Z2 <sup>3</sup>		X2 <sup>2</sup>			
Ae2	Conducting meetings						
Ae3	Informal information sharing	Z1 <sup>3</sup> Z2 <sup>3</sup>		X1 <sup>2</sup> X2 <sup>2</sup> Z2 <sup>3</sup>			
Ae4	Requesting and providing feedback	Z1 <sup>3</sup>					
Ae5	Reminders and prompts						
Ae6	Solving problems and discussion	X2 <sup>1</sup> Z1 <sup>3</sup>		Z1 <sup>3</sup>			
Ae7	Brainstorming and sharing ideas						
Ae8	Keeping in contact / helping others	X2 <sup>2</sup> X2 <sup>1</sup> Z1 <sup>3</sup> Z2 <sup>3</sup>		X1 <sup>2</sup> X2 <sup>2</sup>			
	<b>Project work</b>						
Aw1	Storing information		X1 <sup>1</sup> Z1 <sup>3</sup> Z2 <sup>3</sup>				
Aw2	Sharing information	X2 <sup>2</sup> Z1 <sup>3</sup> Z2 <sup>3</sup>	Z1 <sup>3</sup> Z2 <sup>3</sup>				
Aw3	Sharing work	Z1 <sup>3</sup>	X1 <sup>1</sup> Z2 <sup>3</sup>	Z1 <sup>3</sup> Z2 <sup>3</sup>			
	<b>Management activities</b>						
Am1	Assigning tasks and recording allocation			X2 <sup>2</sup>			
Am2	Checking work progress						
Am3	Reporting task status	Z1 <sup>3</sup>					
Am4	Decision making						
Am5	Project diary						
Am6	Change management	Z1 <sup>3</sup>		Z1 <sup>3</sup>			
Am7	Capturing lessons learned						
	<b>Communication across the boundary</b>						
Ab1	Distributing information externally	Z2 <sup>3</sup>					
Ab2	Gathering external information	Z2 <sup>3</sup>					
Ab3	Contacting external people	X2 <sup>2</sup> X1 <sup>2</sup> Z1 <sup>3</sup>					

### **Impacts and benefits**

In stage three, impacts and benefits in five of the seven categories were identified and no new impacts were identified. Impact on quality of work through feedback (Iq1) and creativity impacts (Ic1 and Ic2) were not explicitly identified in stage three. The omission of quality and creativity as impacts was only identified during data analysis and coding, and was not explored during the interviews. Of the thirty five impacts identified in stages one and two, data from stage three supported ten of these. All impacts and benefits were mapped against the technology types and are shown in Table 4.12.

The findings from stage three are combined with the findings from stages one and two and are shown diagrammatically in Fig. 4.3.



Table 4.12 Impacts and benefits (stage 3)

	<b>Efficiency impacts</b>	<b>Technologies</b>					
		<b>SN</b>	<b>SW</b>	<b>IM</b>	<b>OM</b>	<b>VI</b>	<b>MB</b>
Is1	+Saves time / immediacy	X1 <sup>2</sup> Z1 <sup>3</sup>		X2 <sup>2</sup>			
Is2	+Reduces need to meet						
Is3	+Synchronous document editing		X1 <sup>1</sup>				
Is4	+Driving project forward						
Is5	-Less concise/less formal	X1 <sup>2</sup>					
Is6	-Tasks ignored						
Is7	-Losing track of work						
Is8	-Distracting						
Is9	+Convenient						
	<b>Quality of work</b>						
Iq1	+Feedback improves quality						
	<b>Information management</b>						
Im1	+Eliminates need to send						
Im2	+Easier information sharing						
Im3	+Faster information sharing	Z1 <sup>3</sup>					
Im4	+Saves duplication						
Im5	+Facilitates informal info sharing						
Im6	-Information loss						
Im7	+Extends information sharing						
Im8	+Easy to find information						
Im9	+Information not missed	Z1 <sup>3</sup>					
	<b>Flexibility</b>						
If1	+Ability to work in own time						
If2	+Ability to work at any location						
If3	+Dynamic task allocation	Z1 <sup>3</sup>					
	<b>Transparency</b>						
It1	+All have the same information	Z1 <sup>3</sup>					
It2	+Visibility of work and status						
It3	+Accountability			X2 <sup>2</sup>			
	<b>Creativity</b>						
Ic1	+Facilitates sharing of ideas						
Ic2	+Stimulates thinking						
	<b>Emotional impacts</b>						
Ie1	+Encourages participation (motivation to work)						
Ie2	+Increases focus						
Ie3	+Enjoyment						
Ie4	+Feeling connected	Z1 <sup>3</sup> Z2 <sup>3</sup>					
Ie5	-Fear of overload						
Ie6	-Fear of letting team down/mistakes	Z2 <sup>3</sup>					
Ie7	+Faster trust						
Ie8	+Encourages sensitivity						

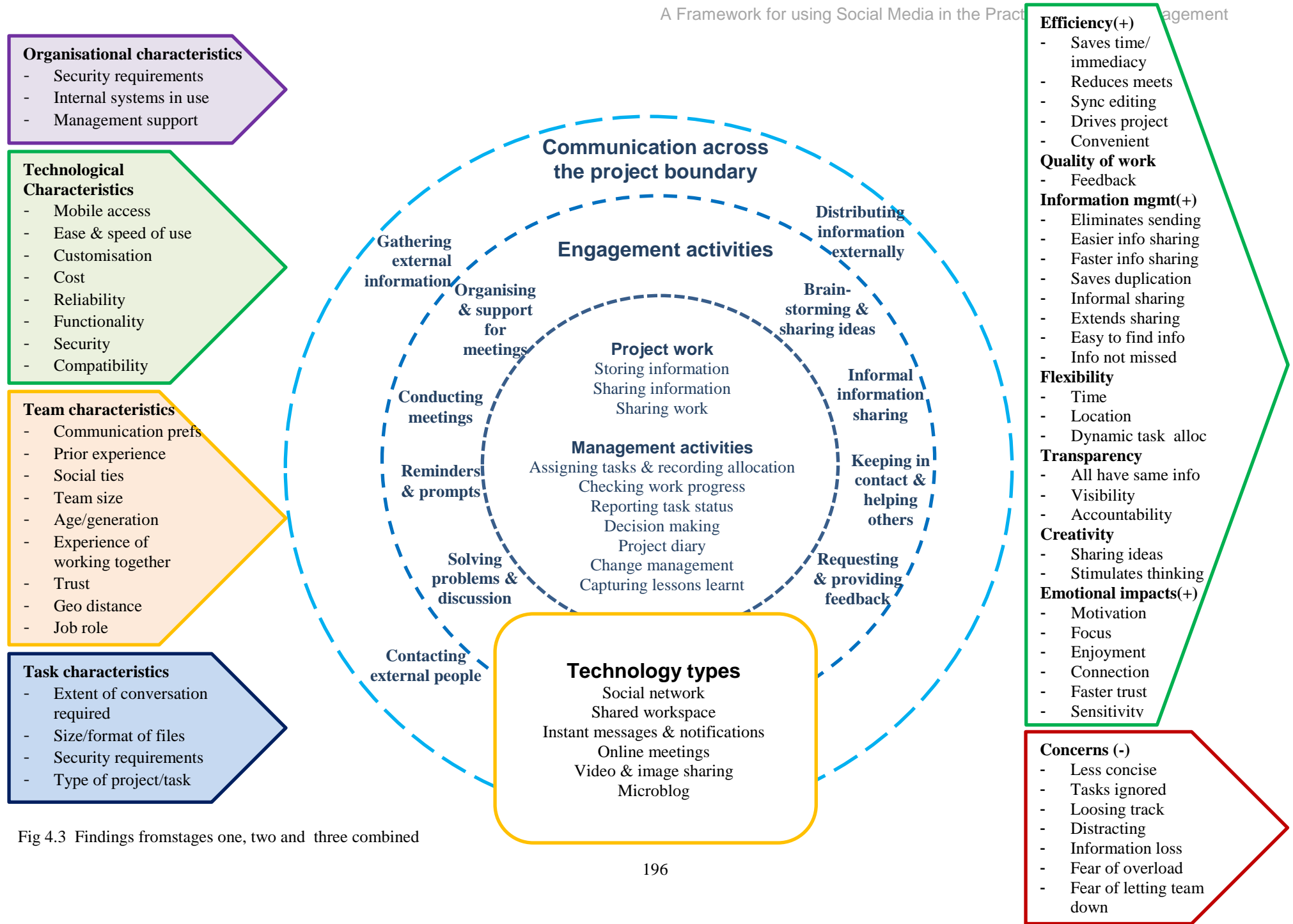


Fig 4.3 Findings from stages one, two and three combined

## 4.7 Validation

This research was designed to have the potential to bridge the gap between theory and practice. Therefore, the context for validation was to view the findings from the perspective of established project management professionals, in order to validate the research problem, process and product. Established practitioners are working within constraints imposed by an organisational setting, and influencing factors were identified in the organisational category in both the conceptual framework and the data. Age was also identified as an influencing factor in the data and the framework, while gender was identified in the framework only. For validation purposes, variety was sought in terms of the industry and the organisation, age and gender.

In total, six interviews were conducted with professional project managers between March and June 2016. The findings were presented as follows:

- At a meeting of professional project managers: Digital Project Managers Meetup 28 June 2016
- At a conference of project management researchers and practitioners: Digital Engagement Online Conference and Workshop 29 June 2016
- In person to two professional project managers.

Three project managers volunteered to participate in this research after the first presentation (H, K and L). One volunteered following the second presentation (J). The findings were individually presented to two further volunteer practitioners (G and R) who identified themselves to the researcher during other discussions. In all cases, the findings were presented to the professionals prior to an interview and, in total, six directed interviews were conducted.

In addition, the researcher was invited to present the research findings at a meeting of the Wessex branch of the Association for Project Management on 16 March 2017 (Thompson 2017). The audience for this presentation included professional project managers from a wide range of organisations, apprentices from a large British multinational defence, aerospace and security company, and project management students.

## Summary of validation results

All the professional practitioners interviewed recognised the research problem and were aware of a range of views about social media in projects. Also, all professionals recognised that a younger generation were driving use of social media, and that research on their behaviour was likely to be useful, as illustrated by participant R:

“Perhaps people um of a younger age, are more used to doing this... because I’ve not grown up with it” (R, p.3)

All the findings were considered valid by all professionals, and they recognised the relevance in industry, as indicated here:

“I think it’s really interesting and I think, I think it is crossing over into industry ...” (H, p.1)

Therefore, the research problem, process and product were all found to be valid. So enthusiastic were the professional interviewees that all went on to discuss their own use of social media. Data was generated from these interviews in a similar way to previous stages and the findings are presented in alphabetic sequence in the remainder of this section.

Much later, the results of this research were presented to a mixed audience at an APM branch meeting. The professional practitioners, apprentices and students were all engaged. Relevant questions came from all types of people, at the end of the formal presentation, including a request for the full mapping of activities and impacts to technology types. The presentation was very well received, as illustrated by the feedback received:

“Many thanks for the presentation last night. In my view it was the most interesting APM presentation I have listened to. thanks for that.” (RB in personal email 17-3-17)

“Very interesting topic and I could see by the faces of the audience how interested they were.” (JP in personal email 17-3-17)

“Really great to the PM’s of tomorrow coming through - the subject matter of Karens presentation was thought prevoking” (APM 2017)

“The event was really helpful with the future development of us.” (APM 2017)

Feedback from the presentation further adds to the validity of the findings.

## Project manager G

G was a project manager working for a large media company, male, age 50+. He volunteered to provide feedback on the research at a meeting of the Wessex branch of the Association for Project Management. The provisional research findings were discussed with him immediately prior to the interview.

G highlighted use of WebEx, Twitter and an internal corporate shared workspace, and highlighted a desire for more use of online collaboration tools:

“We do have a shared workspace, but I think the bit that’s missing at the moment, which will come more to the front, is the online, more of the online collaboration capabilities, so shared online workspace, not company workspace. So I work with, mostly within an organisation but with a few individuals outside, and it’s difficult, I think that’s where new technology will come along....” (G, p1)

Organisational security was highlighted as an overarching constraint on the use of all social technologies and has been coded as a characteristic of the technology (Ft7), the organisation (Fo1) and the task (Fk4), as explained here:

“One of the major influences I’ve now come across is organisational security.... In that, um, basically the type of projects I work on, there is a vast amount of, a need for dissemination. But there’s also a need to be um highly secure in terms of what you do. ” (G, p1)

Characteristics of the technology that influenced use of online meetings were speed of use (Ft2) and the notion of social presence (new Ft9), as explained in these extracts respectively:

“... our need isn’t so much er mobile, but more of speed.” (G, p.2)

“... actually you pick up an awful lot more cues of individuals er in terms of their honesty, and integrity, when you see them, in a conference than you do when you hear them over the phone.” (G, p.2)

Compatibility across technology platforms was highlighted for a shared workspace and was used to extend understanding of compatibility (Ft8):

“... when they accept a meeting invite it always comes across because of the interoperability as tentative, so I have to ring them up and say do you really mean you might not make my meeting, even though the meeting is all about you? And they go no no no, I’ve accepted it.” (G, p.1)

A characteristic of team size (Fm4) was also highlighted as a factor that influenced use of online meeting capabilities:

“... if I've got a problem, and I want five or six people to mull over it, we've, we've used um er the web chat, but that tends to fall down when multiple people are firing different questions into it.” (G, p.3)

G used a combination of instant messaging and online meeting capability in a range of project activities: organising (Ae1), conducting meetings (Ae2), requesting and providing feedback (Ae4), prompting (Ae5), and solving problems (Ae6), as explained in the extracts below. Understanding a problem was also mentioned and this has been used to extend the notion of solving problems (Ae6).

“you can just grab, grab a list of names, throw it out and say tell me when you're free and you get, actually they'll come back and say I'm free between four and five or. And actually you can then commonly see those people all, most if not all, are going to be free at three o'clock, that's fine I'll organise a three o'clock call.” (G, p.3)

“... actually you can actually have a sub-conversation with others to say when, when we come to section three in the next piece will you, can you pick up that for me please, can you run that piece.... by using online and conferencing, use the instant messaging to act, at the same time.” (G, p.2)

“So, as an example, you may have previously created a document, and shared it with people, and asked them for feedback. What I've tried to do is use that capability to, actually hold a meeting, with everyone sharing the same screen [?] so next section whose got a problem with it, I've got a problem in paragraph two, what is it. So you think X, so if I amend it now, does that cover your, right fine. So we make corrections as we go.” (G, p.2)

“I'm on a conference call, saying did you really mean such and such. So I'm now prompting him by an alternative medium,... he'll now clarify, give clarification around it without having, me having, needing to give a verbal prompt.” (G, p.2)

“... let's understand the problem, let's all get on the same page, and er actually that creativity comes when someone throws in an odd curve, of an idea, and they can build upon it.” (G, p.3)

Decision making (Am4) was identified in this extract:

“I'm incorporating, like I would've incorporated comments from individuals, now, at the end of that call I'm not asking for er confirmation of your approval, I've got it. I've taken everyone's comments on board ...” (G, p.2)

G also suggested a team diary (Am5) as a good use of online technology.

The impacts of using online meetings and instant messaging were: saving travel time (Is1) by reducing the need to physically meet (Is2), geographic flexibility (If2), informal information sharing (Im5) and improving the quality of work (Iq1):

“...it saves me having to travel, people there beginning to appreciate that rather than having to get people coming down from different parts of the country for a two hour meeting, um we can use a lot more web conferencing. ... time saving, that cuts out overnight. I used to be based in one location but I’ve now moved to another, primarily because it’s nearer to home.” (G, p.1)

“... it is time saving, it actually means that I, I can um generate um meetings that suit everyone’s time, rather than well we’ve all got to travel to a different location. That means that um the actual day becomes wider for us, in terms of selecting a suitable slot. So that actually, it’s not so much flexibility, it’s the flexibility in, the individual’s flexibility, more around everyone’s availability is higher for an hours meeting when they haven’t got to travel,...” (G, p.1-2)

“So, as an example, you may have previously created a document, and shared it with people, and asked them for feedback. What I’ve tried to do is use that capability to, actually hold a meeting, with everyone sharing the same screen [?] so next section whose got a problem with it, I’ve got a problem in paragraph two, what is it. So you think X, so if I amend it now, does that cover your, right fine. So we make corrections as we go.” (G, p.2)

Flexibility was also linked to the impact of driving the project forward (Is4):

“... not just greater flexibility, but actually more immediacy... it actually keeps project momentum...” (G, p.3)

Creativity by facilitating sharing of ideas (Ic1):

“... let’s understand the problem, let’s all get on the same page, and er actually that creativity comes when someone throws in an odd curve, of an idea, and they can build upon it. Now you don’t get that through other scenarios, it does tend to be when individuals are interacting with one another. Even over a webex capability it seems to work quite well for us.” (G, p.3)

G suggested an impact of “buy in” and he linked this to saving time, therefore this idea has been interpreted under efficiency, as driving the project forward (Is4) and has been used to extend understanding of the emotional impact of feeling connected (Ie4):

“... there is ultimately a time saving but it also means you’ve got greater buy in because people are engaged... get things agreed much quicker. So that’s, I agree wholly with the efficiency side” (G, p.2)

Trust (Ie7) was also identified as an emotional impact of using online meetings:

“... actually you pick up an awful lot more cues of individuals er in terms of their honesty, and integrity, when you see them, in a conference than you do when you hear them over the phone ... So actually that, that to me is also your trust element,...” (G, p.2-3)



## Project manager H

H was the Client Engagement Director of a small digital agency that operates without email, female, age 30-40 years. She attended the Digital Project Managers meetup where the initial research findings were presented (Thompson 2016). She volunteered to provide feedback after the presentation.

H discussed use of Skype (OM), Slack (IM), Basecamp (SW and IM), and WhatsApp (IM) within her organisation.

Prior knowledge of specific technologies was identified as a factor influencing use and this was used to extend the prior experience (Fm2) identified previously. Cost (Ft4) was also identified.

Basecamp, WhatsApp and Skype were all used for managing the project. It is not known to what extent work is allocated using these tools, but explicitly identified was communication to report on task status (Am3) for Basecamp, and managing change (Am6) for WhatsApp and Skype, as illustrated in this extract:

“... clients message me on WhatsApp ... we'll manage it all on Basecamp and I'll keep that all up to date for the client, and then they'll jump onto Skype cos something urgent's come up” (H, p.1)

Sharing work (Aw3) and solving problems (Ae6) were highlighted for instant messaging:

“... Basecamp might not necessarily engage them, but Slack probably does. ... if something happens late at night, you see the team jump on it. And it's a really nice team feeling, when you see oh someone go, oh let me just test that, and I'll check that, and then you see so and so can you just do this, and everyone pulls together. ...you do kinda get that connection and, trust, and y'know team spirit.” (H, p.2)

The extract above also highlights faster information sharing (Im3), flexibility to work at any time of day (If1), dynamic allocation of tasks (If3) and emotional impacts that have been interpreted as the team feeling connected (Ie4) and trust (Ie7). Other impacts that were related to use of Basecamp were geographic flexibility (If2) and transparency of everyone having the same information (It1), as explained here:

“...keeping the communication going...” (H, p.1)

“Actually, they're, they're [the client] based over in Austria” (H, p.1)

“... you can just keep everyone so up to date, with things. ... they can see that it's in control, so they actually don't need to worry about it.” (H, p.1)

H also mentioned feeling “a little bit harassed by it in the industry.” (H, p.1) and this has been added as a new emotional impact (Ie10).

## Project manager J

J was Head of the Project Management Office at an HEI, female, age 50+. She attended the Digital Conference where the initial research findings were presented (Thompson 2016) and volunteered to provide feedback after the event.

J discussed use of Skype (OM), DropBox (SW) and SharePoint (SW). Unidentified technologies were used for instant messaging (IM), video sharing (VI) and live streaming (coded as VI). Use of a blog (coded as MB) was discussed but not considered a success by J.

Ability to access a shared workspace from a range of locations was identified and although mobile access was not specifically mentioned, the notion of accessibility has been used to extend understanding of the technological characteristic Ft1:

“SharePoint is ok if you can access it but whereas DropBox allows people to be able to access that information a lot wider.” (J, p.1)

The blog was not considered a success because of a poor accessibility (Ft1) and lack of ease of use (Ft2):

“We’ve consistently run a blog on er quite a significant project within the university. We still get non-stop complaints about you’re not communicating enough, when we point people at the blog it’s kind of I can’t be bothered to log in and read that what I want is an email.... they expect the information to come to them.” (J, p.1)

She suggested that age/generation (Fm5) might influence the use of blogs and micro blogs in the future:

“Probably as we move forward and younger people start to come through into the workplace, I think it’ll move more naturally because that’s what they’re used to.” (J, p.1)

J reported using online meetings to contact external people (Ab3), send (Ab1) and receive external information (Ab2), brainstorming (Ae7) and solving problems (Ae6), and the shared workspace was used for storing (Aw1) and sharing information (Aw2):

“...was online meetings. We’ve used that extensively recently in the er [project name] particularly for accessing external experts. ... also they’ve sent us and we’ve sent them various videos ...” (J, p.1)

“DropBox where we’ve um shared information.” (J, p.1)

“... brainstorming and the solving problems, again, y’know we’ve used a lot of online tools for that...” (J, p.1)

Instant messenger was also used to share information (Aw2) and videos and live streaming to distribute information externally (Ab1):

“... videos of people using those tools, we’ve got a blog going that says how different people have used those tools. We’ve used instant messenger to pass things around, and in fact we also did a communication news stand at one of our festivals, and that was actually live streamed um around the UK.” (J, p.1)

J identified geographic flexibility (If2) as an impact of using the shared workspace:

“I still like the idea of DropBox because that helps people to work wherever.” (J, p.1)

Sharing information about the project more easily (Im2) to a wider audience than would otherwise have been possible and enabling people to feel connected (Ie4) were identified as a benefit of video sharing and live streaming, as explained in the following two extracts:

“... allowed much wider communication than we would have normally got. Um so one is we got out to a lot more people than we would normally... the communication of our project.” (J, p.1)

“... to make people feel more involved in the project. I think projects have a kind of, um, secrecy around them. Unless you’re part of the project team, you don’t really know what’s going on. And yes people do communicate but it’s kind of to the people that need to know. I think the social technologies allow a much wider communication to a much wider group of people, they may not need to know about the project, but they would be interested to know about the project. And your last slide in your presentation had a sort of onion diagram, and it’s that group of people on the outside that we’re suddenly connecting with, that perhaps projects didn’t connect with before.” (J, p.2)

J also indicated she could see the potential for using a social network to lead to information overload (Ie5):

“... it [social network] would be distracting, some of it would be fear of information overload, or um it would be just that combining of people’s personal lives with their work lives.” (J, p.1)

## Project manager K

K was an Agile and PRINCE 2 certified contract Project Manager, working on projects for a medium-size communications company, female, age 25-35 years. She attended the Digital Project Managers meetup where the initial research findings were presented (Thompson 2016) and volunteered to provide feedback after the presentation.

K discussed use of Lync (used as OM and IM) within her organisation, and use of audio-only conferencing as the main form of collaboration. Although audio conferencing does not involve visual communication, the medium does provide space for social interaction, communication and collaboration, and therefore is considered to be a social technology and has been coded as an online meeting (OM).

K explained that the key influences on the use of technologies were personal preference (Fm1), size of the team (Fm4) and organisational systems (Fo2), as explained here:

“I work for [company name], a massive corporate client, and they’ve got on all of the projects I work on a multitude of stakeholders, across multitude, multiple teams, at all times. And some of them are happy to be like to be messaged on the [?] we’ve got, and some of them just prefer email. But the majority of them make all of the decisions and do their work on conference calls, and that’s the way that they operate.... So to get all of those stakeholders together, the easiest way that they find of doing it within the organisation I work for is on conference calls.... And it’s obviously a bit of a nightmare to try and get any new system into place at [company name], it’s quite a painful procedure.” (K, p.1)

Ease of use (Ft2) and geographic location of the team (Fm8) were also identified as factors that influenced choice and use of audio conferencing:

“... a lot of people at [company name] aren’t collocated, so there’re spread all across the country, we’ve got development teams out in India and who only work until one o’clock in the afternoon, whilst the rest of [company name] are working until five or six o’clock um in the evening. So you’ve got that sort of split in work patterns as well. So to get everyone together, the easiest way of doing that I think they find is obviously a call ...” (K, p.1)

The activities that involved audio conferencing were informal information sharing (Ae3), understanding and solving problems (Ae6) and assigning tasks (Am1), as explained here:

“... everyone can have a say, everyone can actively, should, actively be involved on that call, inputting where they need to, questioning where they need to as well, and getting the outputs that are desired.... And that’s how they do it, they do, hardly any

emails except some notes are sent as a follow up to the call and any action points that need to be picked up on. But the majority is done informally on conference call, with like multiple stakeholders.” (K, p.1)

K highlighted use of online meetings and instant messaging for sharing information (Aw2) and checking on progress (Am2):

“Especially on Lync messages I get a lot important information to projects I’m working on....The client just want’s y’know an update or just to drop you a note so you know about something.” (K, p.2)

The impacts of online meetings and instant messaging identified by K were the flexibility to work remotely (If2) and faster information sharing (Im3):

“... the majority of stakeholders that I liaise with regularly all work from home. They don’t even have a desk space at the [company name] office.” (K, p.1)

“... generally you get a much quicker response to a Lync message than you will to an email. Like if somebody will often take a day to reply to an email, whereas a Lync message it’s usually no more than ten to fifteen minutes and you’ve got a response.  
“ (K, p.3)

K indicated that use of online meetings encouraged participation (Ie1):

You can’t just drop off [web call] and be replying to emails whilst you’re on the call.” (K, p.2)

Information loss (Im6) and that instant messaging can be a distraction (Is8) were highlighted by K, as explained in the following extracts:

“... I’ve found that there is definitely a problem with important information being lost in, sort of transit, almost. Because, where you have the constantly, with [company name] we have these conference calls and often no formal notes are sent up as a follow up ... But once I’ve closed down that Lync window, that information’s gone. ... sometimes I’ve accidentally closed down a Lync window, and I’m like ah no, that contained like some really important information for my project. “ (K, p.2)

“... when I’m on calls if I haven’t set it to do not disturb on status, And I’ll get a message pop up, and it’s a distraction. Or if I’m working on something quite complicated, and if I get a message pop up it is a distraction...” (K, p.2)

## Project manager L

L was a Project Manager at a large multi-national bank, male, age 30-40 years. He attended the Digital Project Managers meetup where the initial research findings were presented (Thompson 2016) and volunteered to provide feedback after the presentation.

L discussed use of Lync (used as OM and IM) within his organisation.

Influences on the choice and use of Lync were the geographic location of the team (Fm8), social presence (Ft9), mobile access (Ft1) and personal choice (Fm1) were identified from the following extract:

“... we have a lot of different locations, um, I think except for we have tele-presence as well. We're encouraged to use that because it's face to face, so you can see the reaction, you can see the physical, y'know people whether they're passively, or being more interactive.... We also have it on our phones as well, so we have a choice.” (L, p.2)

Speed of use (Ft2) was suggested as a factor influencing choice and use from the following extract:

“... I think people would like, senior management would like to remove email, cos of the time spent on it, but it's still a very common medium. And Lync is more urgent stuff...” (L, p.2)

Activities involving online meetings were project preparation and planning that has been interpreted and coded as conducting meetings (Ae2), assigning and recording allocation (Am1):

“We also have [virtual meeting] rooms, that for more um preparation, or planning, we can get whole teams in for different occasions. [?] That's very, [?] I guess that's very close to having them with you.... ” (L, p.2)

L concurred with K on use of Lync to share project information (Aw2) and commented that he “...cut and paste and send an email to myself about it.” (L, p.2)

One impact suggested by L of using Lync was increased engagement as illustrated here:

“... with web presence you have more, you can see and people are more engaged.... Less room to hide....” (L, p.2)

## Project manager R

R was a Carbon Reduction Manager working in local government, male, age 50+. He volunteered to provide feedback on the research at an informal local networking event. The provisional research findings were discussed with him immediately prior to the interview.

R discussed using DropBox (SW), WhatsApp (IM), Twitter (MB) and Skype (OM) on projects within his workplace.

R identified organisational policy (Fo1) and systems (Fo2) influencing use of shared workspace, and organisational policy influencing use of a micro blog:

“... Council also has quite prohibitive er ICT regulations. So therefore I’m probably one of only a handful of people within the Council that’s allowed to use DropBox, because it’s not a trusted site.” (R, p.1)

And that [notifications not set up] is a failure with the corporate system, well done. Yeah, that is what’s, that’s why ... and that’s a good point, that it’s not, that it’s not there and I’m going to take that one away. “ (R, p.1)

“I’m very mindful if I use what I would consider a er er Twitter um project, that’s within the Council, yeah, of the political correctness of the tweets etcetera. And I wouldn’t be saying anything that would could that could bring the Council into either reputational or other er risks, yep. “ (R, p.1)

For use of online meetings and instant messaging, R identified team familiarity (Fm6) and geographic distance (Fm8) as an influencing factor:

“... the core team are already familiar with each other ... because one of the members is in Switzerland, er Skype etcetera is really is really good. “ (R, p.2)

Limited social presence (Ft9) was identified as a characteristic of the technology that influenced online meeting behaviour, as explained:

“... when, when one is not the, taking the lead in the Skype and you’re sat there and you’re watching two other people talk, you’re not getting, you’re not getting the full experience that would that would enable you to think [click of fingers] oh yes I need to talk about this, need to talk about that, and you can then you can add in....“ (R, p.2)

The habits of individuals within the team was identified as a factor that influenced used of the shared workspace, and was used to extend the notion of communications preference (Fm1):

“People are not getting into the habit of going into that work area.....“ (R, p.1)



Communications preference (Fm1) was also identified as a factor that influenced how instant messaging was used:

“I found out how to take the volume off [WhatsApp] ...” (R, p.2)

Generation (Fm5) and prior experience (Fm2) were also mentioned by R as likely influencing factors:

“Perhaps people um of a younger age, are more used to doing this... because I’ve not grown up with it” (R, p.3)

Activities R identified were sharing work (Aw3) using the shared workspace, keeping in contact (Ae8) using instant messenger, informal information sharing (Ae3) using online meetings and instant messenger, and prompts (Ae5) using instant messenger:

“... sharing work [using shared work space] “ (R, p.1)

“... keeping in contact, we also use WhatsApp ...” (R, p.2)

“... engaging team members, yes because one of the members is in Switzerland, er Skype etcetera is really is really good. ... informal information sharing, yes. Because again because we know each other ...WhatsApp messages...” (R, p.2)

“Reminders, requests and prompts, er I think that perhaps feeds back into what you were saying before [WhatsApp] ...” (R, p.2-3)

R mentioned using Twitter to disseminate information about projects (Ab1):

“I’m very mindful if I use what I would consider a er er Twitter um project, that’s within the Council, yeah, of the political correctness of the tweets etcetera. And I wouldn’t be saying anything that would could that could bring the Council into either reputational or other er risks.” (R, p.1)

Impacts identified by R were efficiency (Is1) for the shared workspace, enjoyment of using online meetings (Ie3), and loss of information (Im6):

“ ... there’s no doubt about that is an efficient way of putting it something um on a shared work area... yep, is beneficial for all of the teams ... “ (R, p.1)

“... enjoyment, yes. I enjoy having a Skype because it’s still quite wow, look I’m talking to somebody.... In Switzerland. Cos I don’t Skype other than the project work ... So for me, yeah well this is great fun I’m actually talking to that, isn’t this fantastic use of technology.” (R, p.3)

“... but we seem to have lost some information from, from moving from the shared area version two than from shared version one. “ (R, p.2)

#### 4.8 Analysis of the additional data provided during validation

Of the six technology types identified in earlier stages, five types were used by the professional practitioners and no new types were identified. No use of social networks (SN) was explicitly reported by the professionals and they did not rule out use of social networks in the future. Hence the six types identified in stages one to three were validated. Three applications were discussed that had not previously been found and these were correlated with the technology types already identified. WebEx is online meeting software (OM) and was used by one project manager. Another project manager used Slack and Basecamp. Slack is an online messaging tool (IM) incorporating voice, video and screen sharing. Basecamp is a web-based project management tool that provides shared workspace (SW) and messaging facilities (IM). The specific technologies used are shown in Table 4.13.

Table 4.13 Types of social technology used (validation)

	Interviews					
	G	H	J	K	L	R
SN						
SW	Internal SW	Basecamp	DropBox SharePoint			DropBox
IM	unknown IM	Slack Basecamp WhatsApp	unknown IM	Lync	Lync	WhatsApp
OM	WebEx	Skype	Skype	Lync	Lync	Skype
VI			Video sharing Live streaming			
MB	Twitter		Blog			Twitter

#### Factors influencing choice and use

All four of the categories of factors identified were discussed by the professional practitioners. None of the practitioners rejected any of the individual factors identified, hence all twenty four were validated. One new characteristic was identified (Ft9) in the technological category and this is noted but not discussed further because the factor was not a finding from stages one to three. All factors discussed by the practitioners were mapped against the technology types, as shown in Table 4.14.

Table 4.14 Factors influencing choice and use (validation)

	<b>Technological characteristics</b>	<b>Technologies</b>					
		<b>SN</b>	<b>SW</b>	<b>IM</b>	<b>OM</b>	<b>VI</b>	<b>MB</b>
Ft1	Mobile access / accessibility		J				J
Ft2	Ease and speed of use			L	GKL		J
Ft3	Degree of customization						
Ft4	Cost		H	H			
Ft5	Reliability						
Ft6a	Functionality – support for PM						
Ft6b	Functionality – document mgmt						
Ft6c	Functionality – sync doc editing						
Ft6d	Functionality – file size/formats						
Ft6e	Functionality – group discussion						
Ft6f	Functionality – notifications						
Ft6g	Functionality - translation						
Ft7	Security / privacy offered	G	G	G	G	G	G
Ft8	Compatibility with equipment / platform		G				
Ft9	Social presence				GR		
	<b>Team characteristics</b>						
Fm1	Communications preferences / habit		R	KR	K		
Fm2	Prior technology experience & knowledge incl personal use		H	HR			
Fm3	Social ties						
Fm4	Team size			K	GK		
Fm5	Age / generation			R			J
Fm6	Experience of working together						
Fm7	Trust						
Fm8	Geographic distance			LR	KLR		
Fm9	Job role						
	<b>Organisational characteristics</b>						
Fo1	Security requirements / policy	G	GR	G	G	G	GR
Fo2	Internal systems in use / policy		R	K	K		
Fo3	Management support						
	<b>Task characteristics</b>						
Fk1	Extent of conversation required						
Fk2	Size/format of file/s involved						
Fk3	Security requirements	G	G	G	G	G	G
Fk4	Type of project/task						

## How social media were used

Activities identified by the professionals were correlated with all four of the categories identified and therefore the four categories of activities were validated. None of the twenty one activities identified were rejected by the practitioners, hence all were validated. No new activities were identified in validation, suggesting the methods used can be considered reliable. The activities explicitly identified by the practitioners were mapped against the technology types and are shown in Table 4.15.

Table 4.15 How social technologies were used (validation)

	<b>Activities</b>	<b>Technologies</b>					
		<b>SN</b>	<b>SW</b>	<b>IM</b>	<b>OM</b>	<b>VI</b>	<b>MB</b>
	<b>Engagement activities</b>						
Ae1	Organising/support for meetings			G	G		
Ae2	Conducting meetings			G	GL		
Ae3	Informal information sharing			M	KR		
Ae4	Requesting and providing feedback			G	G		
Ae5	Reminders and prompts			GR	G		
Ae6	Solving problems and discussion			GH	JGK		
Ae7	Brainstorming and sharing ideas				J		
Ae8	Keeping in contact / helping others		H	HR	H		
	<b>Project work</b>						
Aw1	Storing information		J				
Aw2	Sharing information		J	JK	KL		
Aw3	Sharing work		R	GH	G		
	<b>Management activities</b>						
Am1	Assigning tasks and recording allocation			H	KL		
Am2	Checking work progress			K	K		
Am3	Reporting task status		H	H			
Am4	Decision making			G	G		
Am5	Project diary		G				
Am6	Change management		H	H	H		
Am7	Capturing lessons learned						
	<b>Communication across the boundary</b>						
Ab1	Distributing information externally					J	R
Ab2	Gathering external information						
Ab3	Contacting external people				J		

### **Impacts and benefits**

Seven categories of impacts were discussed by the professional practitioners, suggesting the methods used are reliable. None of the professionals rejected any of the individual benefits and concerns, and hence all thirty five impacts were validated. One new impact of a negative emotional impact of feeling harassed (Ie9) was discussed by one practitioner. All impacts and benefits discussed by the professionals were mapped against the technology types and are shown in Table 4.16.

Table 4.16 Impacts and benefits (validation)

	<b>Efficiency impacts</b>	<b>Technologies</b>					
		<b>SN</b>	<b>SW</b>	<b>IM</b>	<b>OM</b>	<b>VI</b>	<b>MB</b>
Is1	+Saves time / immediacy		R	G	G		
Is2	+Reduces need to physically meet			G	G		
Is3	+Synchronous document editing						
Is4	+Driving project forward			G	G		
Is5	-Less concise/less formal						
Is6	-Tasks ignored						
Is7	-Losing track of work						
Is8	-Distracting			K			
Is9	+Convenient						
	<b>Quality of work</b>						
Iq1	+Feedback improves quality				G		
	<b>Information management</b>						
Im1	+Eliminates need to send						
Im2	+Easier information sharing					J	
Im3	+Faster information sharing			HK	K		
Im4	+Saves duplication						
Im5	+Facilitates informal info sharing			G	G		
Im6	-Information loss		R	K	K		
Im7	+Extends information sharing					J	
Im8	+Easy to find information						
Im9	+Information not missed						
	<b>Flexibility</b>						
If1	+Ability to work in own time			H			
If2	+Ability to work at any location		HJ	GHK	GHK		
If3	+Dynamic task allocation			H			
	<b>Transparency</b>						
It1	+All have the same information		H	H			
It2	+Visibility of work and status						
It3	+Accountability						
	<b>Creativity</b>						
Ic1	+Facilitates sharing of ideas			G	G		
Ic2	+Stimulates thinking						
	<b>Emotional impacts</b>						
Ie1	+Encourages participation (motivation to work)				K		
Ie2	+Increases focus						
Ie3	+Enjoyment				R		
Ie4	+Feeling connected / engaged			GH	GL	J	
Ie5	-Fear of overload	J					
Ie6	-Fear of letting team down/mistakes						
Ie7	+Faster trust			GH	G		
Ie8	+Encourages sensitivity						
Ie9	-Feeling harassed			H	H		

## 4.9 Summary of all findings

In this section, the results from the three stages plus validation are brought together and synthesised as a series of tables, one for each of the four questions.

Overall, six types of technology were identified (Table 4.17). None of the professional project managers interviewed in validation discussed use of a social network. However, use of a social network was discussed in both interviews with alumni in stage 3. In one interview (X), use of a social network for social purposes was discussed. In the other interview (Z) extensive use of an internal corporate social network was reported. Hence, social networks are included in the findings of this research.

Twenty four influencing factors are validated and grouped into four categories (Table 4.18). One new factor, social presence (Ft9), was identified only by two professionals, but not in earlier stages and therefore is not included in the findings of this research. Eight technological characteristics were validated, nine characteristics of the team, three organisational characteristics and four characteristics of the task.

Twenty one activities are classified into four types (Table 4.19) and all were validated: eight engagement activities, three project work activities, seven project management activities and three activities involving communication across the project boundary.

Thirty five impacts in seven categories were validated (Table 4.20). One new impact, feeling harassed (Ie9), was identified only by one professional and is considered similar to fear of overload (Ie5). Five benefits and four concerns were validated in the efficiency category. Improved quality of work was validated as a benefit. Eight benefits and one concern were validated in the category of information management. Three flexibility benefits, three for transparency and two for creativity were also validated. Eight impacts that were identified as affective, and classified as emotional impacts, were validated: six are considered to be beneficial (positive) and two were concerns (negative).

Overall, the validated findings can be seen in Fig. 4.3. The findings will be compared with the literature and discussed in the next chapter.

Table 4.17 Types of social technology used (all interviews)

Code	Type	Networks and applications	Use
SN	Social networks	Facebook	All student teams and discussed by four out of six individual students (stages 1 and 2). No use found in stages 3 or 4
		Podio	One pilot team (A, stage 1)
		LinkedIn	One member of a student team, when on placement (V, stage 2)
		Yammer	For social purposes only by one alumni in the workplace (X2, stage 3)
		internal social network based on VM ware	Used by two alumni working for the same organisation (Z1 and Z2, stage 3)
SW	Shared workspace	GoogleDocs	One team and one individual (M and C, stage 2)
		Google Drive	Two individuals (T and C, stage 2)
		DropBox	Two teams and three individuals (M, S, N, Y and P, stage 2) and two professional project managers (J and R, validation)
		Microsoft OneDrive	One individual (P, stage 2)
		SharePoint	All alumni (stage 3) and one professional project manager (J, validation)
		Basecamp	One professional project manager (H, validation)
		Un-named shared drive, internal to organisation	One alumni (X2, stage 3) and one professional project manager (G, validation)
IM	Instant messaging	WhatsApp	Two teams, one individual (S, V and Y, stage 2) and two professional project managers (H and R, validation)
		Slack	One professional project manager (H, validation)
		Lync	Two professional project managers (K and L, validation)
		Messaging from SN, SW or computer game	Both pilot teams (stage 1), one team, four individuals (M, E, F, U and P, stage 2), two alumni (Z1 and Z2, stage 3) and one professional project manager (H, validation)
		Un-named messenger	One team, one individual (S and N, stage 2) and two professional project managers (G and J, validation)
OM	Online meeting	Skype	One pilot team (A, stage 1), one team (V, stage 2) and three project managers (H, J and R, validation)
		Lync / Skype for business	One member of a student team, when on placement (S, stage 2)
		WebEx	One professional project manager (G, validation)
VI	Video and image sharing	YouTube	Both pilot teams (round1) and one professional project manager (J, validation)
		Pinterest	One individual (F, stage 2)
MB	Micro blog / blog	Twitter	One pilot team (A, stage 1) and two professional project managers (G and R, validation)
		Un-named blog	One professional project manager (J, validation)



Table 4.18 Factors influencing choice and use (all interviews)

	<b>Technological characteristics</b>	<b>Technologies</b>					
		<b>SN</b>	<b>SW</b>	<b>IM</b>	<b>OM</b>	<b>VI</b>	<b>MB</b>
Ft1	Mobile access / accessibility	ABMSV	MSBJ	ABMS VY			J
Ft2	Ease and speed of use	AMVDT UX	ABM	AVDE FUXL	GKL		J
Ft3	Degree of customization	A	A	A			
Ft4	Cost	AYZ	AYH	ASYH			
Ft5	Reliability		B				
Ft6a	Functionality – support for PM	A		A			
Ft6b	Functionality – document mgmt	Z	BCZ				
Ft6c	Functionality – sync doc editing		AM				
Ft6d	Functionality – file size/formats	ANYZ	ABNY P	A			
Ft6e	Functionality – group discussion	ABDU		ABDE U			
Ft6f	Functionality – notifications	ABY	Z	ABY			
Ft6g	Functionality - translation	Z					
Ft7	Security / privacy offered	MVTXZ G	XMZ G	XG	XG	XG	XG
Ft8	Compatibility with equipment / platform		CG	S			
	<b>Team characteristics</b>						
Fm1	Communications preferences / habit	ABMVT PZ	MR	ABEP ZKR	K		
Fm2	Prior technology experience & knowledge incl personal use	ABMDT Z	MYEH	ABVD EHR			
Fm3	Social ties	ABMN		ABS			
Fm4	Team size	BMYCX Z		BCK	GK		
Fm5	Age / generation	MZ	V	R			J
Fm6	Experience of working together			SY			
Fm7	Trust			S			
Fm8	Geographic distance	Z		LR	KLR		
Fm9	Job role	Z					
	<b>Organisational characteristics</b>						
Fo1	Security requirements / policy	XZG	XGR	XG	XG	XG	XGR
Fo2	Internal systems in use / policy	XZ	MR	K	K		
Fo3	Management support	Z					
	<b>Task characteristics</b>						
Fk1	Extent of conversation required	ABSN		ABS			
Fk2	Size/format of file/s involved	ABNP	ABNP	ABP			
Fk3	Security requirements	MG	MG	MG	G	G	G
Fk4	Type of project/task					F	

Table 4.19 How social technologies were used (all interviews)

	<b>Activities</b>	<b>Technologies</b>					
	<b>Engagement activities</b>	<b>SN</b>	<b>SW</b>	<b>IM</b>	<b>OM</b>	<b>VI</b>	<b>MB</b>
Ae1	Organising and support for meetings	ABMDN TYCUZ	A	ABSV DEFU XG	G		
Ae2	Conducting meetings			G	ASGL		
Ae3	Informal information sharing	ABMTY CUZ		ABSV NUXZ R	KR		
Ae4	Requesting and providing feedback	ABSDZ		ABDG	G		
Ae5	Reminders and prompts	A		ASGR	G		
Ae6	Solving problems and discussion	BMUXZ		BMFU ZGH	JGK		
Ae7	Brainstorming and sharing ideas	BT		BS	J	BF	
Ae8	Keeping in contact / helping others	ABVYC EUXZ	H	ABSV EUXH R	H		
	<b>Project work</b>						
Aw1	Storing information	ABSVN	ABMS YXZJ				
Aw2	Sharing information	ABSVN	ABMS YPZJ	ABNE JK	KL		
Aw3	Sharing work	ABVDN YZ	ABMS TYXZ R	ABDZ GH	G		
	<b>Management activities</b>						
Am1	Assigning tasks & recording allocation	ABMDT Y		ABSX H	KL		
Am2	Checking work progress	AYC		ASEK	K		
Am3	Reporting task status	ABDZ	H	ABDH			
Am4	Decision making	A		AG	G		
Am5	Project diary	N	G			A	
Am6	Change management	ABNZ	ABH	ABSV FZH	H		
Am7	Capturing lessons learned		V			A	
	<b>Communication across the boundary</b>						
Ab1	Distributing information externally	Z	P		J	AJ	AR
Ab2	Gathering external information	VCPZ			J		A
Ab3	Contacting external people	MDCPX Z			J		

Table 4.20 Impacts and benefits (all interviews)

	<b>Efficiency impacts</b>	<b>Technologies</b>					
		<b>SN</b>	<b>SW</b>	<b>IM</b>	<b>OM</b>	<b>VI</b>	<b>MB</b>
Is1	+Saves time / immediacy	ABMT YXZ	BR	ABMS VTYE FXG	G		A
Is2	+Reduces need to physically meet	AY		AYEG	G		
Is3	+Synchronous document editing		AMX				
Is4	+Driving project forward	AUY		AUYG	G		
Is5	-Less concise/less formal	BYX		BYE			
Is6	-Tasks ignored	MP		P			
Is7	-Losing track of work			E			
Is8	-Distracting			EK			
Is9	+Convenient	P	P				
	<b>Quality of work</b>						
Iq1	+Feedback improves quality	ABSD		ABD	G		
	<b>Information management</b>						
Im1	+Eliminates need to send	N	A				
Im2	+Easier information sharing	MD	AY	D		J	A
Im3	+Faster information sharing	BZ		BHK	K		
Im4	+Saves duplication		A				
Im5	+Facilitates informal info sharing	ABP		ABSP G	G		
Im6	-Information loss	BY	R	BYK	K		
Im7	+Extends information sharing	M				J	
Im8	+Easy to find information	N					
Im9	+Information not missed	YZ		YE			
	<b>Flexibility</b>						
If1	+Ability to work in own time	ABN	ABN	ABSV H	V		
If2	+Ability to work at any location	ABN	ABNH J	ABSV GHK	VGHK		
If3	+Dynamic task allocation	ABPZ		ABSH			
	<b>Transparency</b>						
It1	+All have the same information	BYPZ	H	BYPH		F	
It2	+Visibility of work and status	AB		AB			
It3	+Accountability	B		BSX			
	<b>Creativity</b>						
Ic1	+Facilitates sharing of ideas	BU		BUG	G	BF	
Ic2	+Stimulates thinking					A	
	<b>Emotional impacts</b>						
Ie1	+Encourages participation (motivation to work)	AUY		ASUY	K		
Ie2	+Increases focus	ABM		ABMV E			
Ie3	+Enjoyment				R	A	
Ie4	+Feeling connected / engaged	BYZ		BYGH	GL	J	
Ie5	-Fear of overload	BJ		B			
Ie6	-Fear of letting team down/mistakes	AZ		A			
Ie7	+Faster trust			SGH	SG		
Ie8	+Encourages sensitivity	T		T			

Finally, although the performance of the technologies was not measured numerically, an indication of performance has been derived from the qualitative data. In Table 4.21, the technologies have been ranked using a) the number of different benefits identified, and b) the number of interviews where benefits were identified for the technology. These findings will be discussed in the next chapter.

Table 4.21 Benefits by social technology

<b>Social technology</b>	<b>Number of different benefits identified</b>	<b>Number of interviews where benefits were identified</b>
Social network (SN)	22	12
Shared workspace (SW)	10	11
Instant messaging (IM)	19	15
Online meeting (OM)	11	7
Video & image creation & sharing (VI)	5	4
Micro blog (MB)	2	1

## 5 Discussion of findings

### 5.1 Introduction and structure of the discussion

This work set out to address the question: How do social media interact with the practice of project management? Four objectives were developed as follows:

1. To understand what social media are relevant to managing projects.
2. To investigate the factors that influence use of social media in project settings.
3. To explore the behaviours involved in using social media to manage projects.
4. To explore the perceptions of the impacts, consequences and concerns of using social media in project settings.

Participants from whose narratives the data was generated in stages 1, 2 and 3 were young people, at the start of their professional lives and whose experience with social media pre-dates their experience of formally managing projects. As a function of selecting such participants, the findings provide a contemporary view of how such young people integrate social technologies with managing projects. Previous research involved “experts” (Gimpel et al 2014) whereas this work uncovered perceptions of a new generation of project managers and team members. The field site chosen also provided a context where the influence of formal approaches to project management are minimised.

Professional project management practitioners were used to validate the findings. Data was generated from interviews with experienced personnel working in a range of organisational settings. The data uncovered a wide variety of experiences (as discussed in section 4.7), indicating that practices vary widely between different workplaces. All the categories of data and elements identified were validated, indicating the findings are relevant beyond an HEI setting.

The literature on social media in projects tends to focus on virtual teams (e.g. Giltenane 2016). In contrast, participants in this research were co-located with other team members i.e. generally there were opportunities for personal contact and face-to-face meetings. Team location was similar between the HEI setting for stages 1 and 2, and the workplace settings of projects in stages 3. All the findings from stages 1, 2 and 3 were validated with professional project managers working in a range of organisational settings. Therefore, this research has implications for co-located teams both in HEI settings and in a range of workplace settings.

Also unlike much other work in the field of project management, this research took a socio-perspective. Projects and project management were re-conceptualised that

brings communication, human interaction and learning to the fore. Social technologies are defined here in a way that emphasises “social interaction, communication, collaboration and community formation” (Zhao et al 2013, p.290). This work identifies the technologies used in project settings, uncovers the behaviours involving social media and reveals perceptions about the benefits and concerns of using social media in managing projects.

The conceptual framework has four components, corresponding to the four objectives, and the findings were presented using this structure. This chapter is also organised in the sequence of the objectives. In the following two sections, the technologies and perceptions of the factors that influenced adoption and use are discussed (sections 5.2 and 5.3). Next, the behaviours involving social technologies are discussed (section 5.4). The activities are then interpreted using theory from the fields of knowledge management and organisational learning respectively (sections 5.5 and 5.6). Next, perceptions of the benefits and concerns (section 5.7) and the performance of different social technologies are discussed (section 5.9). Conclusions are drawn in the final chapter, chapter six.

## 5.2 Social media used in managing projects

The definition of social technologies used in this work referred to systems, web sites and applications (Zhao et al 2013) in contrast to the written, verbal and face-to-face media identified by Müller (2003). A typology of nine types of social technology was developed for this work in the conceptual framework. Six technology types found in this research are discussed in this section, as illustrated in Fig. 5.1.

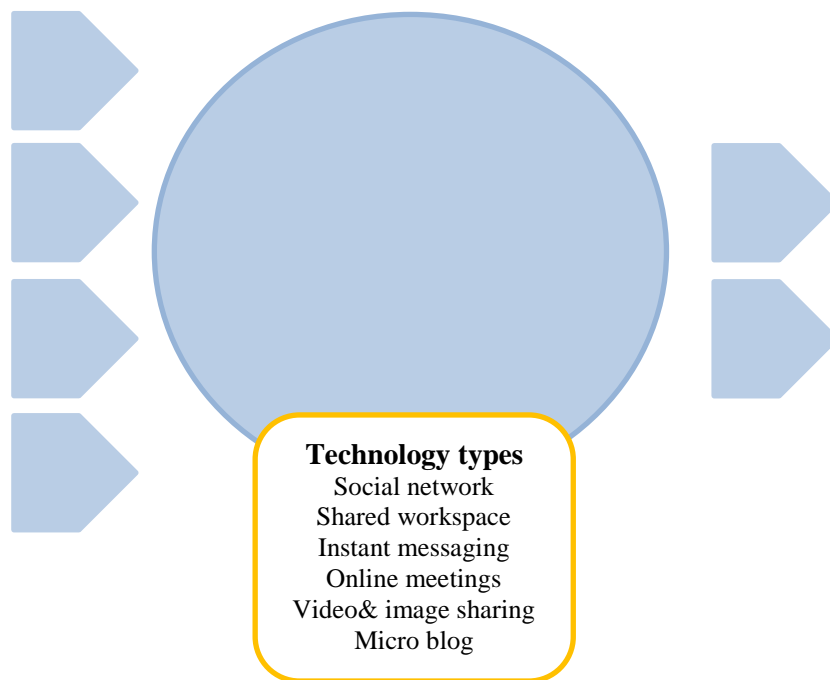


Fig 5.1 Technology types found in this research

Three types of technology – blogs, wikis and events calendar/task scheduling tools – were not identified in this research. No significant use was found for blogs and wikis in this context. One professional project manager discussed unsuccessful use of a **blog** and suggested the lack of success was because users expect information to come directly to them, and the blog was not sufficiently easy to access. The only use of a **wiki** was by students to present their work for assessment purposes at university, rather than managing their project, and therefore wiki was discounted. **Events calendar/task scheduling tools** were not explicitly mentioned in any interviews but are suggested by APM (2014) as useful for managing projects. Events calendar/task scheduling tools are recent developments in social media and it may be that, although the practitioners who contributed to APM (2014) are aware of such tools, their use has yet to become widespread.

Six types of technology were found in this work and are listed below in order of the number of interviews (shown in brackets) where they were discussed:

1. Instant messaging (21)
2. Social network (18)
3. Shared workspace (16)
4. Online meeting (9)
5. Video and image sharing (4)
6. Micro blog (4)

Five of the types identified above (1-4, 6) correspond to five of the nine types within the conceptual framework. Video and image sharing was identified from the data and replaces the Newsfeed/Podcast/Vodcast type identified in the conceptual framework. Hence, the six technology types are confirmed in this research.

**Instant messaging** was the most widely used technology, discussed in all interviews. Student teams using the social network Facebook made use of the instant messaging facility, Facebook chat, within the social network for a range of activities. Other student teams and two professional project managers used WhatsApp, an application that enables instant messaging between mobile phones from different manufacturers. Other students and professionals used the instant messaging facilities within other software, such as LYNC, Slack and Basecamp. The blurring between types of software particularly around group messaging was noted in the previous chapter.

The **social network** Facebook was used by almost all the student participants but not at all by professional project managers. In the organisation where two alumni worked, there was extensive use of a corporate social network for project work. Another alumnus discussed use of an internal corporate social network, Yammer, for social purposes only. No social network was mentioned in the validation interviews, although some features that might be associated with a social network are provided by Basecamp and Lync, as the distinctions between technologies blurs.

Students generally used publically available cloud storage such as DropBox and GoogleDocs to provide a **shared workspace**. Some professional project managers used public services but the most commonly identified shared workspace used in a professional setting was an internal systems based on software such as SharePoint.



Skype was the **online meeting** facility mentioned most frequently, and was used by students and professionals. YouTube was mentioned for **sharing videos** and links were embedded in instant messages and social networks. The specific purpose of Pinterest is **sharing images**, and this was how it was used by one student. The only **micro blog** mentioned was Twitter and this was used by students and professionals.

Research on social media in project management is limited. Harrin (2010a) identified ten types, derived from her experience and opinions. Gimpel et al (2014) identified seven types by revising earlier literature using six “expert” interviews. The “experts” who participated in Gimpel et al’s (2014) research were all “technology-savvy consultants with substantial project experience” (ibid., p.6) who would have been influenced by traditional notions of project management. In contrast, the present work has uncovered the perspectives of young people whose experience with social technologies pre-dates their experience for formally managing projects, about what they actually do when managing a project.

Data for this work was collected over a three-year period, 2013-2016. During that time practices, understandings and technology have changed and this further explains the differences between the findings and the initial typology. For example, use of WhatsApp became more widespread from 2013 to 2015, and instant messaging facilities have been embedded in more software over a similar time. Hence, the findings of this work represent a contemporary view of the social technologies used in managing projects. Reasons for the choices made and the factors that influenced use will be discussed in the next section (section 5.3).

It should be noted that the impact of time identified above applies to all aspects of the research, not only to technology types, but will not be repeated in the discussion of every aspect.

### 5.3 Factors influencing the choice and use of technologies

In the conceptual framework, twenty-two influencing factors were grouped into four categories. In this research, twenty-four influencing factors were validated in four categories. The four validated categories are similar to the four categories in the conceptual framework and the factors are discussed below, by category.

Differences between the categories in the conceptual framework and those identified from the data are, in part, because much of the literature on technology adoption and use is based on case studies on individual technology in a specific setting. In many of the case studies, use of technology was driven top-down by an organisation, and project management was not a focus. Here, a bottom-up approach was used, and there was emphasis on managing projects. Social collaboration in project work was a focus of the research by Gimpel et al (2014) but they did not identify factors influencing adoption and use. The categories are now discussed in turn.

#### Technological characteristics

Kügler et al (2013) used the term technological characteristics to mean perceptions of using social technologies, rather than perceptions of the technologies themselves. Following Kügler et al (2013), the same term was used for the first category of factors identified during analysis of the data. Eight characteristics were identified in the conceptual framework and eight were validated in this work.

The most frequently mentioned technological characteristics related to perceptions of **accessibility on mobile devices** (Ft1) and the **ease and speed of use** (Ft2). Mobile access was not identified as a factor in the literature and this may be because earlier research pre-dated the ubiquity of mobile phone use for and within the workplace. Mobile access was particularly highlighted in the data as a factor for social network (SN), instant messaging (IM) and shared workspace (SW), and was mentioned by one professional project manager for micro blog. Ease of use was identified as a factor in previous research (Kügler et al 2013, Brown et al 2010, Venkatesh et al 2003, Davis 1989), while speed of use is included here and is interpreted as adding to an understanding of what “ease of use” means in the context of social technologies.

**Customisation, cost, and reliability** were factors found in this research that were not identified in previous literature. A possible reason why these factors have not been identified before is that the focus of previous work was organisational-driven use (e.g. Kügler et al 2013). For organisation-driven initiatives, cost would be borne by the organisation and is therefore unlikely to influence adoption or use. Customisation and

reliability may also have been considered as infrastructure issues and unlikely to influence adoption or use.

**Perceived usefulness** was identified in previous research (Kügler et al 2013, Brown et al 2010, Venkatesh et al 2003, Davis 1989). The **functionality factors** (Ft6a-Ft6g) identified in the present work are interpreted as specific types of perceived usefulness. These functionality factors relate to how the technologies are used (see section 5.5). Five of the seven functionality factors were identified in more than one interview and indicate different interpretations of usefulness relevant to managing projects. Support for project management (Ft6a) was only mentioned by one team in the pilot and may be accounted for because in 2013, when this data was collected, social media for project management were novel, whereas by the time further data was collected the phenomenon was more widespread. Another potential explanation is that four out of five of the team concerned were studying project management, and the topic may have been uppermost in their minds, whereas the other pilot team were not studying project management so may not have considered the topic to the same extent. Translation facilities (Ft6g) were only mentioned in one interview and are relevant to the specific situation of international networking.

**Security** (Ft7) was validated in this research and discussed by APM (2014). Perceptions of security were mentioned in all types of interview – students, alumni and professional project managers – and are therefore an important consideration.

**Compatibility** (Ft8) was defined by Kügler et al (2013) as perceptions of consistency with users' values, needs and past experiences, and was validated in this research. Compatibility as discussed in the present work is concerned specifically with the compatibility between technological platforms for shared workspace and instant messaging. Kügler et al's (2013) view of compatibility is echoed in factors identified as team factors and will be discussed further in the next section.

Social presence was mentioned by two professional practitioners but not by students or alumni. This may be due to difference in perceptions of social media amongst different generations. Brown et al (2010) found some support for the influence of social presence on perceived ease of use and usefulness for two specific technologies. Social presence was discussed by two professional project managers in relation to online meetings and their preference for video over audio-only. In this way, social presence may contribute to perceptions of usefulness and could be incorporated into a generic construct of functionality.

Three factors identified in previous research - results demonstrability (Kügler et al 2013), immediacy and concurrency (Brown et al 2010) – were not identified in the data so it is not clear from this work whether these factors influence technology choices. Social presence was identified by Brown et al (2010) but was only identified by two professionals and therefore is not included in the findings of this work.

### **Team characteristics**

Ten characteristics of the individual and group were found in the literature. The unit of analysis in this work was a team and nine characteristics of the team were validated. Seven of the nine factors identified have some similarities with those in the literature.

**Prior experience** and knowledge of social media, including personal use, (Fm2) was identified from the data from all types of interview. Prior experience correlates with the findings of others (Giltenane 2016, Kügler et al 2013, Brown et al 2010, Venkatesh et al 2003).

**Social ties** (Fm3) were identified in five interviews. Social ties was not mentioned by any alumni or professional project managers and this could be because the social connections between team members are not valued, or even recognised, in the workplace as much as they are amongst students. Social ties has some similarity with social influence identified in literature (e.g. Kügler et al 2013, Brown et al 2010) and is included as a validated factor.

**Experience of working together** (Fm6) was mentioned in two interviews and was validated. Familiarity with others was identified by Brown et al (2010) and is similar to the experience of working together found here.

**Age and generation** of team members (Fm5) was a factor identified from the data for all types of interview, and age was identified in previous research (Giltenane 2016, Venkatesh et al 2003). Hence, age/generation is confirmed as an influence on use of social media.

**Trust** (Fm7) was identified in one interview and in the literature. The factor of trust could be integrated with the notion of social ties and further research is required to understand how teams understand these concepts.

The influence of **job role** (Fm9) on use of social media was well explained in one alumni interview (Z) but was not found in the literature.

**Communications preferences and habit** (Fm1) is an individual characteristic that was found in the data, but was not identified in literature, and has been included in the team category. This factor was mentioned in ten interviews, across all types, and therefore is important. It is unclear why this factor has not been recognised in previous research.

**Team size** (Fm4) and **geographic distance** (Fm8) were both identified as factors influencing use of three types of technology (SN, IM and OM), yet were not identified from the literature. The influence of team size was mentioned in all types of interview, and was linked to geographic distance in some situations. For example, Z1 said she would be unlikely to use a social network group if the team was small and co-located. In contrast, several interviewees suggested a social network group worked well because the team was small. Geographic distance was highlighted particularly by professional project managers as a factor that influenced use of technology. Both factors were validated by this research.

Four characteristics of individuals and the group were identified in the conceptual framework and were not found in the data. Influences from collaboration norms, technology self-efficacy, gender and reputation were not found and the reasons have not been explored. It is possible that widespread adoption of social media for personal use and the blurring of work boundaries have changed or removed these factors as influences, and confirmation could be sought from further research.

### **Task characteristics**

Four characteristics of the task were identified and validated in this research. Three characteristics of the task (Bok et al 2012) and two of the project (Müller 2003) were identified in the conceptual framework. The four task characteristics identified in this research are different from those identified in the literature. No evidence is provided by this research for the absence of the task factors identified in the literature.

Two of the characteristics identified are a corollary of two characteristics that were identified under functionality of the technology. **Security requirements** (Fk3) was highlighted by one team and one project manager as determining which, if any, social technologies were used. Security was also validated as a characteristic of the task. **Size/format of files** (Fk2) was identified for social network (SN) and shared workspace (SW) by participants in the pilot and stage two i.e. students, in choosing which technology to use to share files. The reasons why size/format was mentioned neither

by alumni nor professionals are unclear but, as a practical constraint on use, it could be they considered the factor too obvious to mention. This research found evidence that perceptions of both factors have a strong influence on whether a social technology is used.

**Extent of conversation required** (Fk1) was highlighted in four interviews as having an influence on whether a social network group was used for a task, and in one interview on whether instant messaging was used. Brown et al (2010) investigated the impact of technological characteristics (social presence, immediacy and concurrency) on different types of task, and they made a distinction between decision-making and idea-generation tasks. The distinction made by Brown et al (2010) was not found in the data on influencing factors. Participants in this research distinguished between decision-making and sharing ideas in relation to how technologies were used (see section 5.4 for the discussion of how social technologies were used). Reasons why the extent of conversation was not mentioned by the professionals are unclear but they may have considered the factor too obvious to mention. The extent of conversation required is one new aspect of the task that influences use of social media identified here.

The **type of project/task** (Fk4) was mentioned in one interview (F); specifically highlighting use of image sharing (VI) if a project was a visual project. Other participants may have perceived the type of project to be self-evident, as a function of the organisational setting, and have not explicitly mentioned the factor for this reason, but the present work has not provided evidence to support this suggestion. However, theory on task-technology fit (Goodhue and Thompson 1995) suggests task type will influence technology choice. Hence, for the purposes of this work, type of project has been combined with task type as an influencing factor. It is noted that further research is required to develop theory on the relevance of task-technology fit to the use of social media on projects.

Müller (2003) found that clarity of project goals and method was a determinant of project communication. The project characteristics of clarity of goals and method may have a bearing on the extent of conversation required in individual tasks, but were not uncovered in the present work. Task immediacy, complexity and urgency were identified by Bok et al (2012) and were not uncovered here.

### **Organisational characteristics**

Three characteristics of the organisation were identified and validated in this research. Perceptions of three characteristics of the situation were described in the literature and there are some similarities with those found here.

Participants working in a business setting i.e. alumni and professional project managers highlighted the **security policy** (Fo1) and security requirements of the organisation. Security as a characteristic of the situation is consistent with security as a technological characteristic and a task characteristic already discussed, although here it is the policy and requirements of the workplace that influence use, or not, of social technologies. Brown et al (2010) identified technology-facilitating conditions, and here security policy was found to be a facilitating condition.

**Internal systems and policies** (Fo2) was identified in all types of interview as influencing choice and use of social technology in specific situations and this too is a technology facilitating condition.

**Management support** (Fo3) was identified in one stage 3 (alumni) interview and is closely correlated with the influence of superior identified by Brown et al (2010) as one of two situational characteristics of co-workers.

Overall, the twenty-four factors validated have been consolidated into twenty-two factors, in four categories, that influence use of social media for managing projects, as illustrated in Fig. 5.2.

The discussion now turns to the behaviours involved with using social media in managing projects.

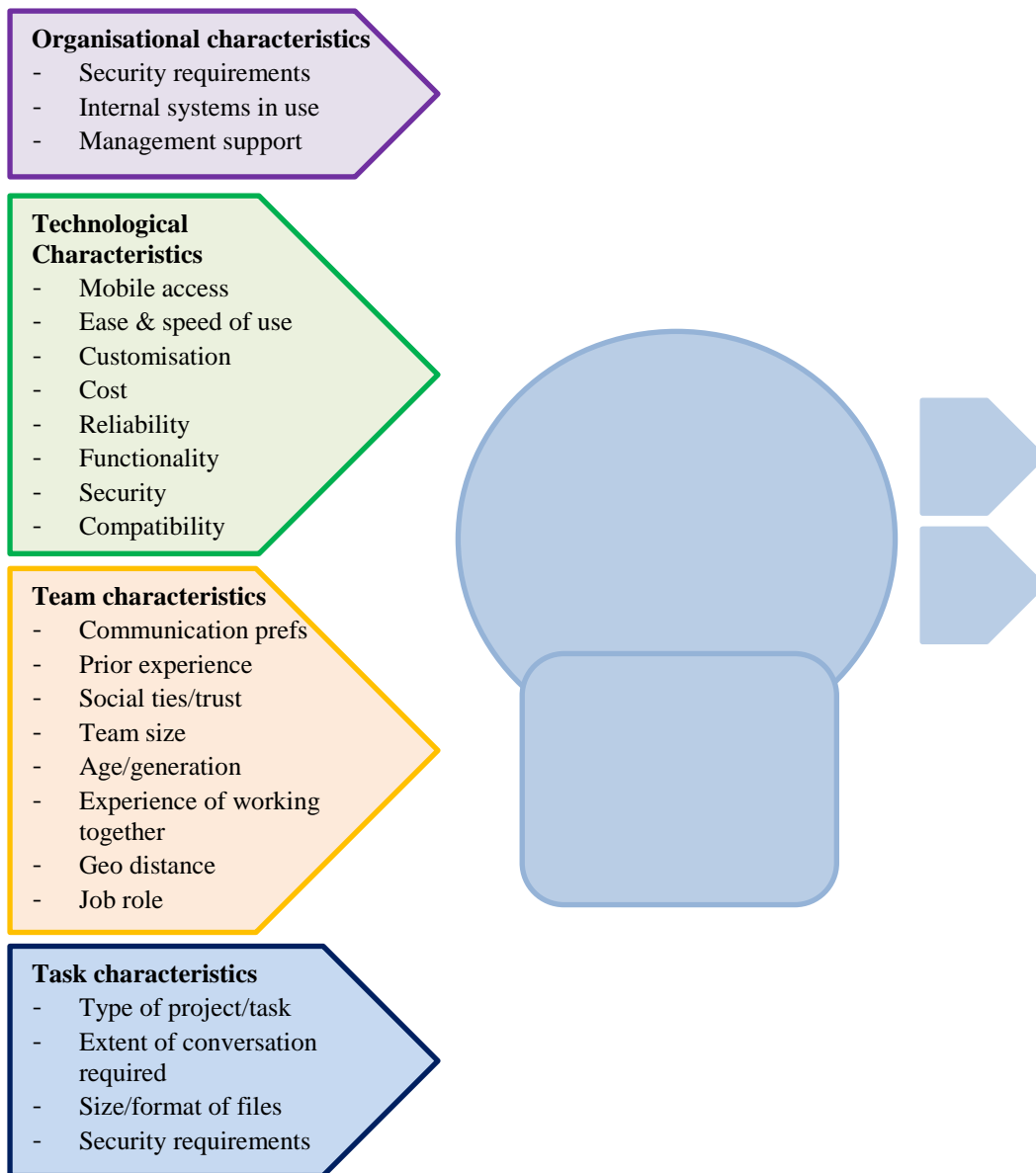


Fig 5.2 All factors influencing use of social media for managing projects



## 5.4 Behaviours involved in managing projects with social media

A range of behaviours were suggested by Zhao et al's (2013) definition of social technologies, i.e. "social interaction, communication, collaboration and community formation" (ibid, p.290). In this research, twenty-one activities were validated in four categories,

The four categories correspond to the four categories identified in the conceptual framework. Each category will now be discussed in turn.

### Project work

Three types of project work were validated in this research and four were identified in the conceptual framework. The three types validated have some similarity with three of the types found in the literature. Feedback and learning was suggested by the theory on organisational learning (Daft and Weick 1984) and agile methods (e.g. Augustine 2005) but was not found in this research. Feedback and learning will be discussed in more depth in section 5.6.

Collaboration and teamwork were suggested by Harrin (2010a), and Turban et al (2011) suggested implementation, corresponding with the type of activity called **sharing work** (Aw3) identified from the data. Harrin (2010a) suggested blogs, shared workspace, instant messaging and micro blog were suitable for project work. Turban et al (2011) suggested all types of social technologies, except for shared workspace, were suitable. In contrast, sharing work (Aw3) involved social network (SN), shared workspace (SW), instant messaging (IM) and online meetings (OM). The work of Harrin (2010a) and Turban et al (2011) was not based on empirical evidence, so the present work provides evidence from a practitioner perspective about what is required and what works in practice.

**Storing information** (Aw1) was identified in the data and in research (Gimpel et al 2014). Knowledge management was suggested by Harrin (2010a) and this could be interpreted as including the storage of information. Gimpel et al (2014) found storing information mainly involved shared workspace and wikis to a lesser extent, although they found some use of all technologies except for online meetings. Blogs and wikis were suggested for knowledge management by Harrin (2010a). In the present work, no use of blogs and wikis were found. Here, social network (SN) and shared workspace (SW) were used to store information (Aw1). Gimpel et al's (2014) research involved professional project managers and the different findings may be explained by the organisational context. For example, use of social networks may be precluded by

company policy and the systems in use might include wikis. However, a shared workspace is intended for the storage of information and both studies found this was the primary technology used for storing information.

A third type of activity identified in the data was **sharing information** (Aw2). Sharing information was not separately identified in literature but may be considered by other authors to be part of knowledge sharing (Van der Merwe 2016), spreading external content in the project team (Gimpel et al 2014), knowledge management (Harrin 2010a) or collaboration /teamwork (Harrin 2010a). In this work, sharing information was identified as an important part of project work by all types of participant, and involved social network (SN) (stages 1 and 2), shared workspace (SW) (all stages), instant messaging (IM) (stages 2 and 4) and online meetings (OM) (validation only). Current literature on use of social technologies lacks sufficient granularity to separate sharing information from other related activities, and some literature does not separate use of different social technologies at the level of specific activities. This work, on the other hand, provides evidence of the use of specific technologies for specific activities from a practitioner perspective.

Project work is located in the Zone of Participation in the conceptual framework. This research has found three project work activities associated with participation in the project.

### **Management activities**

Seven management activities involving social media were validated in this research. Four management activities were included in the conceptual framework and these correspond to four of the validated activities. This research extends understanding of the project management where social media can be deployed.

**Assigning tasks and recording allocation** (Am1) was validated in this work and is similar to planning and organising project processes (Silvius and Silvius 2016) and coordinating project work (Gimpel et al 2014) identified in the conceptual framework. Social network (SN) and instant messaging (IM) were the technologies involved in assigning tasks and recording allocation used by participants in stages one, two and three, and the professional project managers used online meetings for the same activity. In contrast, Gimpel et al (2014) found the most use of shared workspace, instant messaging and wikis for coordinating project work, and all technologies were identified except online meetings. The differences in findings between the stages in

this research, and when compared with Gimpel et al (2014), may result from the situational characteristics, such as the systems in use.

**Checking work progress** (Am2) and **reporting task status** (Am3) were validated and correlate with Harrin's (2010a) suggestion of status updates. Harrin (2010a) suggested instant messaging and micro blogs could be used. Instant messaging (IM) was used by all types of participant in this research, confirming Harrin's (2010a) suggestion. Micro blogs were not used, a difference from Harrin's (2010a) suggestion. Participants in stages one and two also used social network (SN) for status updates, and professional project managers (validation) mentioned shared workspace (SW) and online meetings (OM), both at variance with Harrin (2010a). The present work provides evidence that the choice of technology for status updates is wider than suggested in the literature.

**Project diary** (Am5) was identified from data analysis and corresponds with Harrin's (2010a) suggestion for a project log. Harrin (2010a) suggested blogs and wikis could be used for a project diary, yet in this work two teams used social network (SN), one team created and shared videos (VI), and one professional project manager used a shared workspace (SW). Harrin's (2010a) work was not based on empirical research and the present work provides evidence from a practitioner perspective about what works in practice.

**Decision making** (Am4) was identified by one team (A) and one professional project manager, consistent with Turban et al's (2011) suggestion and Van der Merwe's (2016) suggestion of thought leadership. Social network was suggested by Turban et al (2011) and was used by both pilot teams. Online meetings (OM) and instant messaging (IM) were used by the professional project manager but only instant messaging was suggested by Turban et al (2011). Turban et al (2011) also suggest blogs, micro blog, and wikis could be used but this research found no evidence to support the suggestion.

In addition to the management activities already discussed, two new management activities were identified in this work. **Change management** (Am6) was mentioned in six different interviews across stages 1, 2 and 4. Change management involved instant messaging (IM), social network (SN), shared workspace (SW) and online meetings (OM). Change management was not separately identified by other authors but may be considered part of, for example, coordinating project work (Gimpel et al 2014). Change management was validated and is therefore included as a management activity

involving social media and extends understanding of how social media can be used in managing projects. **Capturing lessons learnt** (Am7) was mentioned in two interviews and involved a shared workspace (SW), social network (SN) and video creation/sharing (VI). Use of social media to share lessons learnt and best practice with other project managers is suggested by APM (2014) and is suggested as a way of improving project management practice generally, rather than being focussed on a specific project.

Project management activities are located in the Zone of Participation in the conceptual framework. This research validated seven management activities associated with participation in the project.

### Engagement activities

Eight engagement activities were identified in this research and all were validated. Six engagement activities were included in the conceptual framework. All six of the engagement activities suggested by the literature correspond to validated activities. Two new engagement activities were validated in this work and thereby extend understanding of project engagement.

**Organising and supporting meetings** (Ae1) was identified from data analysis and is compared with Gimpel et al's (2014) organizing meetings. Support for meetings was an important component of the activity discussed in interviews, for example following up actions and filling in the gaps between meetings were included:

“... we use it as a way to complement the meetings we have and kind of fill in the gaps...” (Team B, p.8)

Gimpel et al (2014) found all types of social technology, except online meetings, were used to organize meetings, predominantly shared workspace and instant messaging. The engagement activity identified from the data predominantly involved social network (SN) and instant messaging (IM). In addition, one pilot team and one professional project manager used shared workspace (SW) and online meetings (OM) respectively. Therefore, the findings are similar although blogs, micro blogs, wikis and newsfeed/podcast/vodcast were not used.

For meetings, Harrin (2010a) suggests use of online meetings and shared workspace. Dennis et al (2010) suggested instant messaging. In this work, online meetings (OM) were used to **conduct meetings** (Ae2), consistent with Harrin's (2010a) suggestion, but shared workspace was not used. One professional project manager used instant messaging (IM) to supplement online meetings (OM):

“... actually you can actually have a sub-conversation with others to say when, when we come to section three in the next piece will you, can you pick up that for me please, can you run that piece.... by using online and conferencing, use the instant messaging to act, at the same time.” (G, p.2)

This finding is consistent with Dennis et al's (2010) research on “invisible whispering”.

**Informal information sharing** (Ae3) was identified in all types of interview, and hence was validated. Social network (SN) and instant messaging (IM) were primarily involved, and two project managers suggested online meetings. Gimpel et al (2014) found all types of technology, except online meetings (not included in their research), were involved with what they call informal exchange. Gimpel et al's (2014) findings suggest that practice in the workplace is more varied than this study found.

Discussion, solving problems and brainstorming were three activities identified by Gimpel et al (2014).

**Solving problems and discussion** (Ae6) were combined into one construct in this work, and was validated. This work found social network (SN), instant messaging (IM) and online meetings (OM) were involved. Gimpel et al (2014) found all technologies were involved (except online meetings), with the most use of instant messaging, followed by shared workspace.

**Brainstorming and sharing ideas** (Ae7) was validated and compared to Gimpel et al's (2014) brainstorming. Gimpel et al (2014) found shared workspace and wikis were predominantly used for brainstorming. In this research, social network (SN) and video/image sharing (VI) were used by two teams, instant messaging (IM) by one team and one project manager mentioned online meetings for brainstorming. In addition, sharing ideas extends the notion of brainstorming found by Gimpel et al (2014).

Differences between the technologies used for each activity as validated by this research, and the work of Gimpel et al (2014), and suggests more variety in workplace practices than found in this study.

Two new engagement activities involving social media are validated in this work.

**Keeping in contact and helping others** (Ae8) was highlighted in ten interviews, of all types (all stages), and involved social network (SN) and instant messaging (IM). For **reminders and prompts** (Ae5), a social network (SN) was used by one team, instant messaging (IM) by another team, and project managers mentioned instant messaging

(IM) and online meetings (OM). These new activities extend understanding of engagement in projects.

Engagement activities are associated with the Zone of Interpretation and this could more appropriately be called the Zone of Engagement. Gathering feedback was an activity suggested in the Zone of Interpretation in the conceptual framework, although no specific technologies were suggested in the literature. **Requesting and providing feedback** (Ae4) was an engagement activity validated in this work. Requesting and providing feedback used a social network (SN), and one project manager mentioned instant messaging (IM) and online meetings (OM).

Overall, eight engagement activities were validated in this research.

### **Communication across the project boundary**

The fourth and final category of activities involving social media relates are activities concerned with communication across the project boundary. Three activities were identified in this research and all three are validated. Communication across the project boundary is most closely associated with the Zone of Connectivity the conceptual framework. The three validated activities are discussed below.

**Contacting external people** (Ab3) was mentioned in seven interviews across all types and involved mainly social network (SN), although one project manager used online meetings (OM). Sourcing external expertise (Gimpel et al 2014, APM 2014) and integrating external collaborators (Gimpel et al 2014) were identified in the conceptual framework and have some similarities with the activity validated here. Gimpel et al (2014) found all technology types, particularly shared workspace and instant messaging to a lesser extent, were used to integrate external collaborators; and Harrin (2010a) suggested use of instant messaging for obtaining answers from outside team and blogs for communication beyond the project team. The activities highlighted by both Gimpel et al (2014) and Harrin (2010a) are similar to those identified in this work, although the technologies suggested are different.

**Gathering external information** (Ab2) was mentioned in four interviews and involved social network (SN) and micro blog (MB). In the conceptual framework, scanning was suggested as a necessary activity for a learning organisation (Daft and Weick 1984) and involves gathering external information. Other activities suggested in the literature that would typically involve gathering external information are: researching information and discussing challenges with other project managers (Van der Merwe (2016),

surfacing resistance (Cadle and Yeates 2008) and gathering feedback, lessons learnt and best practice (e.g. APM 2014). Harrin (2010a) suggests blogs and social networks for communication beyond project team and obtaining answers from outside team, whereas the present work found use of social networks, online meetings and micro blogs.

**Distributing information externally** (Ab1) was mentioned in four interviews and involved shared workspace (SW), video and image sharing (VI) and micro blog (MB). Harrin (2010a) suggested use of blogs for communication beyond project team. Other activities suggested in the literature that could involve distributing information externally are: stakeholder management (APM 2014), relationship building (Van der Merwe 2016), sharing the project vision (Müller and Turner 2010), and sharing lessons learnt and best practice (APM 2014, Van der Merwe 2016).

Three activities are validated in the category of communication across the project boundary, and this third zone of communication is now referred to as the Zone of Connection.

Overall, twenty-one activities are validated in four categories, and these are mapped onto three zones of communication, as illustrated in Fig. 5.3.

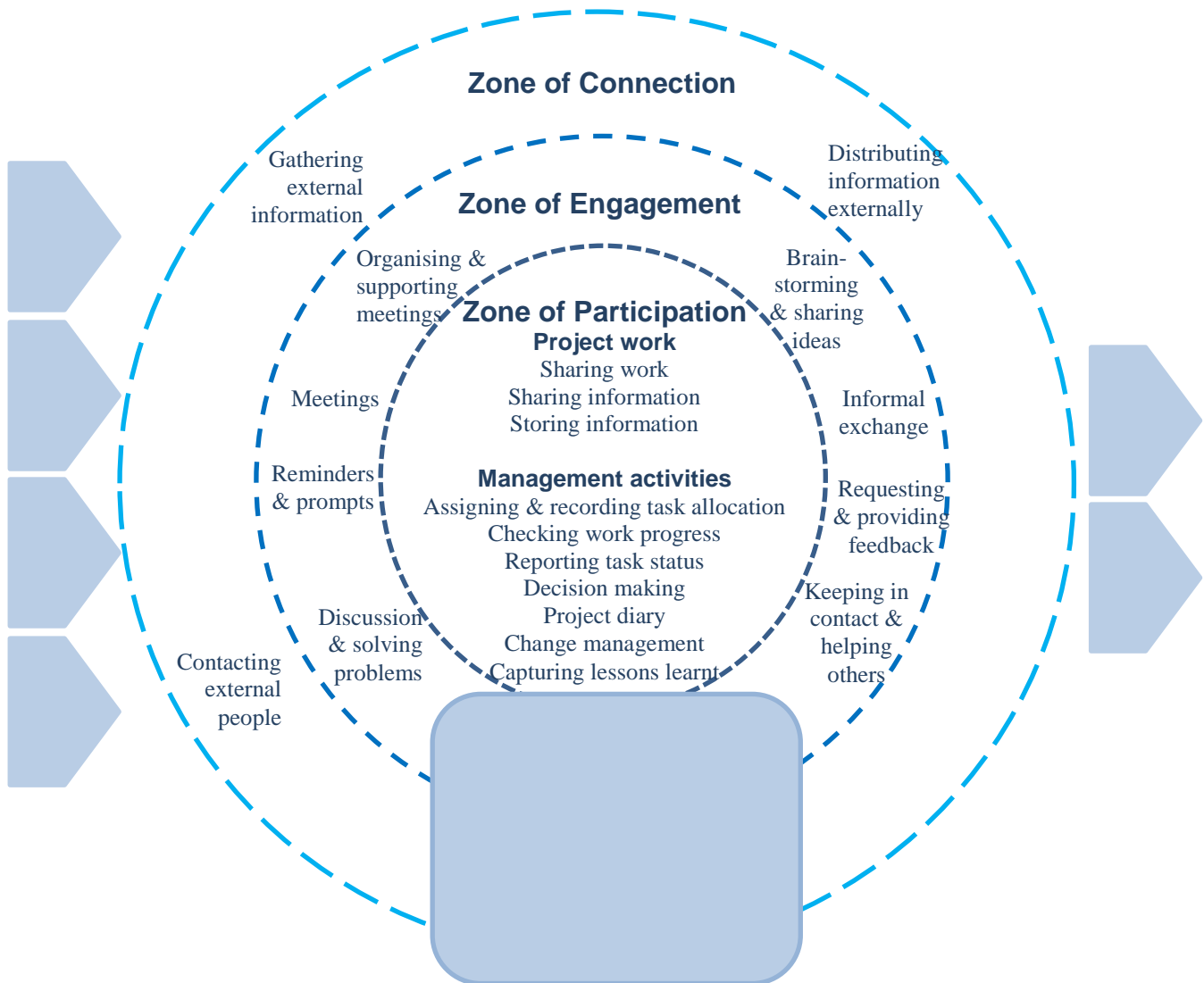


Fig 5.3 Validated activities for social media in managing projects

The behavioural findings have been interpreted using theory imported from the disciplines of knowledge management and organisational learning. These interpretations are discussed in the following two sections.



## 5.5 Knowledge management in projects

A traditional approach to project management has been shown to emphasise explicit knowledge, with less attention to tacit and causal knowledge (Reich and Wee 2007). Knowledge transformation is considered to involve four processes are all are considered essential for the development of new knowledge as shown in the SECI Model of Knowledge Transformation (Nonaka and Konno 1998). Reich and Wee (2007) demonstrate that traditional project management, as described by the PMI's (2004) body of knowledge, only references two of the four processes. The two processes concerned with tacit knowledge – internalisation and socialisation - are not referenced by traditional project management processes, as illustrated in Fig. 5.4.

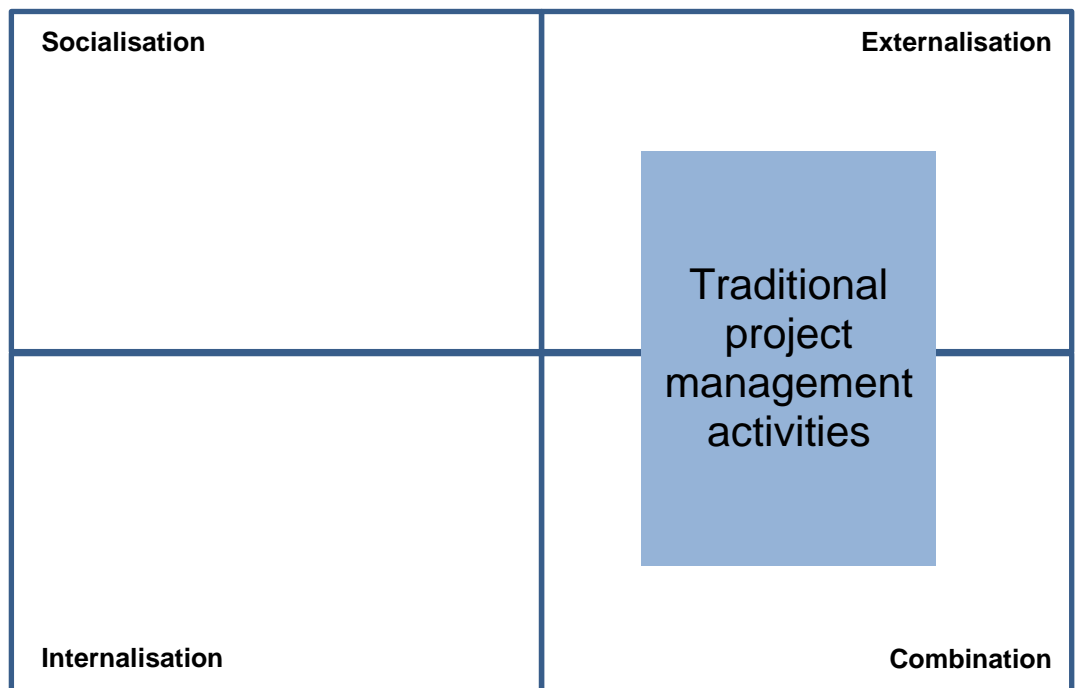


Fig 5.4 Knowledge management in traditional project management (based on Reich and Wee 2007)

The twenty-one activities validated in this research have been mapped onto the four processes described by the SECI Model, and the results are shown in Table 5.1. In contrast to traditional forms of project management, this work has uncovered activities related to all four processes. Specifically, it is the engagement activities that address socialisation and internalisation, as shown in Fig. 5.5. Facilitating access to tacit knowledge was suggested by Remidez and Jones (2012) and is consistent with the findings here.

Table 5.1 Mapping of project management activities to knowledge transformation processes

	<b>Activities</b>	<b>Knowledge input</b>	<b>Knowledge output</b>	<b>Knowledge management process</b>
	<b>Engagement activities</b>			
Ae1	Organising and support for meetings	Tacit	Explicit /Tacit	Externalisation/ Socialisation
Ae2	Conducting meetings	Tacit	Tacit	Socialisation
Ae3	Informal information sharing	Tacit	Tacit	Socialisation
Ae4	Requesting and providing feedback	Tacit	Tacit / Explicit	Socialisation/ Externalisation
Ae5	Reminders and prompts	Tacit	Explicit	Socialisation
Ae6	Solving problems and discussion	Explicit /Tacit	Tacit /Explicit	Externalisation/ Combination/ Internalisation/ Socialisation
Ae7	Brainstorming and sharing ideas	Tacit	Tacit	Socialisation
Ae8	Keeping in contact / helping others	Tacit	Tacit	Socialisation
	<b>Project work</b>			
Aw1	Storing information	Explicit	Explicit	Combination
Aw2	Sharing information	Explicit	Explicit	Combination
Aw3	Sharing work	Explicit /Tacit	Explicit /Tacit	Combination/ Externalisation/ Internalisation/ Socialisation
	<b>Management activities</b>			
Am1	Assigning tasks & recording allocation	Tacit	Explicit	Externalisation
Am2	Checking work progress	Tacit	Explicit	Externalisation
Am3	Reporting task status	Tacit	Explicit	Externalisation
Am4	Decision making	Tacit	Explicit	Externalisation
Am5	Project diary	Tacit	Explicit	Externalisation
Am6	Change management	Tacit	Explicit	Externalisation
Am7	Capturing lessons learnt	Tacit	Explicit /Tacit	Externalisation/ Socialisation
	<b>Communication across the boundary</b>			
Ab1	Distributing information externally	Explicit	Explicit	Combination
Ab2	Gathering external information	Explicit /Tacit	Explicit	Combination/ Internalisation
Ab3	Contacting external people	Tacit	Tacit /Explicit	Socialisation/ Externalisation

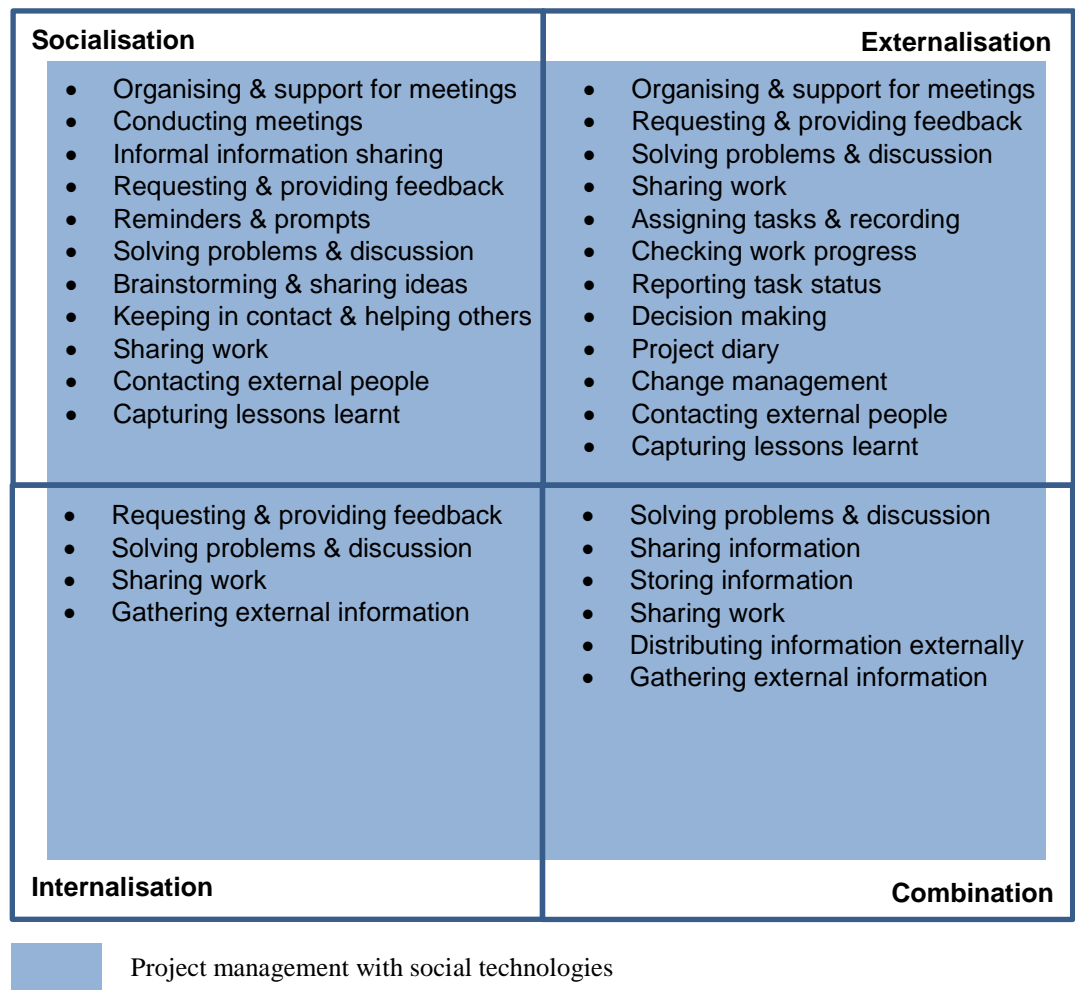


Fig 5.5 Activities involving social media in knowledge transformation

### Filling the gaps with social technology

All the engagement activities, with the exception of conducting meetings (Ae2), involved use of a social network and instant messaging. Instant messaging was widely used to contact team members, for purposes including organising meetings and informal knowledge sharing, and notifications kept team members up-to-date with information and changes. Reducing the need for face-to-face meetings was a benefit of using social technologies. In addition, social technologies were used to keep team members engaged with the project in between face-to-face meetings, as explained by Team B:

“... we use it as a way to complement the meetings we have and kind of fill in the gaps...” (Team B, p.8)

Messaging was particularly important for filling in the gaps, both in between meetings and during meetings. Dennis et al (2010) found instant messaging enabled “invisible whispering” that they suggest “alters the socio-spatial temporal boundaries of team

decision making” (ibid. p. 845). This is consistent with use of instant messaging being used concurrently with online meetings to influence participation, as described by one project manager:

“... actually you can actually have a sub-conversation with others to say when, when we come to section three in the next piece will you, can you pick up that for me please, can you run that piece.... by using online and conferencing, use the instant messaging to act, at the same time.” (G, p.2)

Thus, social media are being used to increase communication amongst team members, enabling all four processes that are essential for knowledge creation. In this way, social media are addressing a limitation of traditional approaches to project management.

## 5.6 Projects as learning organisations

Conventionally, a project is conceptualised as an action process. External communication is about the project, and is transmitted from the project in an outwards direction only. Communication among those directly involved with the project is also highlighted, particularly in modern agile methods. Existing project management literature tends to characterise communication as either internal or external, as illustrated in Fig. 5.6, and one effect is that projects tend to become disconnected from their environment.

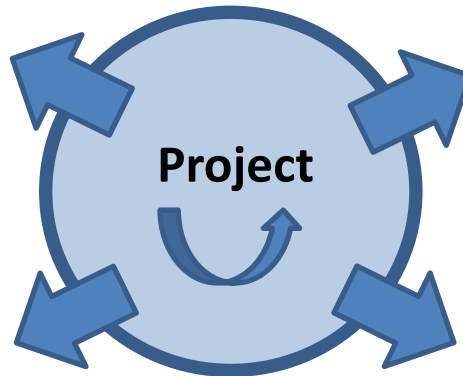


Fig 5.6 Communication as described in existing project management literature

In contrast here, organisational learning theory has been used to suggest three zones of project communication are required and communication needs to be both inwards and outwards. The twenty-one activities identified in this research are classified in four categories, as shown in section 5.4. Two categories – project work and management activities – involve activities typical of traditional approaches to project management, and are associated with the zone of participation. The engagement activities involve tacit knowledge and are concerned with giving data meaning. Hence, the engagement activities are correlated with Daft and Weick's (1984) notion of interpretation. In the fourth category of communication, gathering external information (Ab2) is correlated with scanning, as described by Daft and Weick (1984).

Inwards communication is identified explicitly by the activity gathering external information (Ab2) in communication across the boundary. Inward communication is also likely to be involved in the engagement activities. Thus, communication both inwards and outwards, and related to all three zones of communication, has been uncovered by this work, as illustrated in Fig. 5.7.

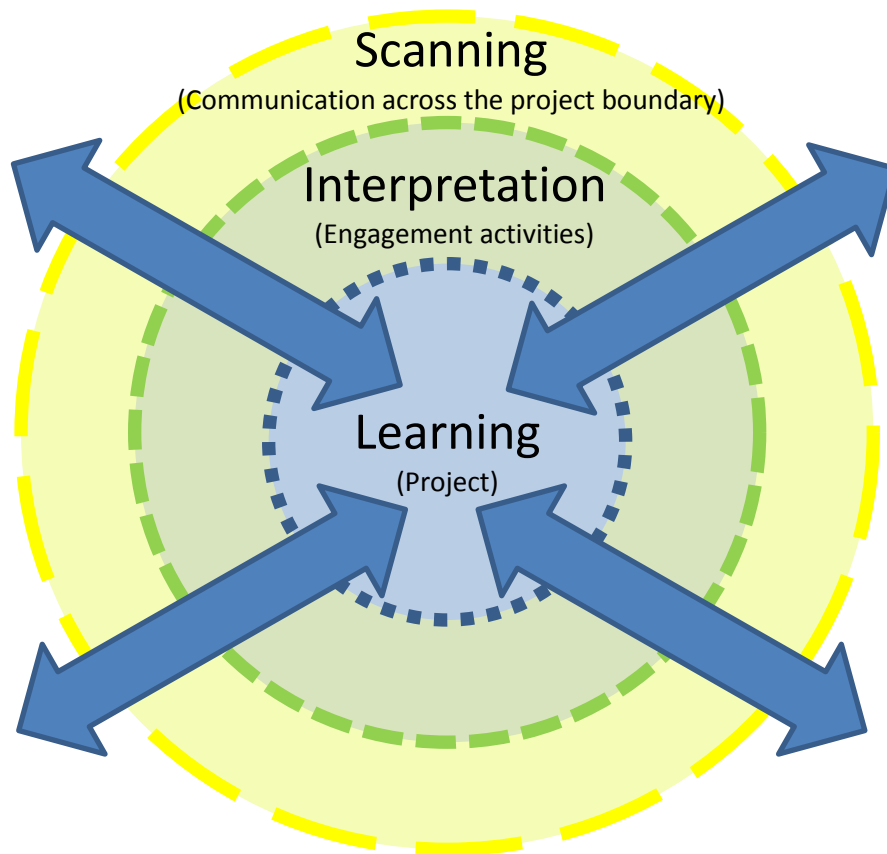


Fig 5.7 Communication in three zones and two directions

Social media are being used to increase communication beyond the project boundary in two directions that enables organisational learning to occur. In this way, social media are addressing another limitation of traditional approaches to project management.

## 5.7 Benefits and concerns of using social media

The fourth and final part of the research was concerned with uncovering perceptions of the impact of social media on managing projects. In this research, perceptions of thirty-five impacts from using social media are validated in seven categories. Twenty-eight impacts are perceived positively as benefits, and seven are perceived negatively as concerns.

In the conceptual framework, eight benefits and one concern were identified. Gimpel et al (2014) is the only research identified that links impacts to individual technologies (online meetings were not included in their research).

Overwhelmingly the impacts were perceived positively, as benefits of using social media in managing projects. In three categories – efficiency, information management, and emotional impacts – some negative perceptions were noted as concerns. The perceptions of impacts identified in this research have been compared with impacts recorded from the literature and are discussed below.

### Efficiency

Nine separate impacts were identified in the category of efficiency and all were validated. Gimpel et al (2014) identify a benefit of efficiency and similar notions of efficiency are discussed by Van der Merwe (2016), Remidez & Jones (2012) and Bughin et al (2011). In this research, **saving time and providing immediate access** to team members and information was validated as one impact (Is1). Perceptions of saving time were mentioned in twelve interviews, across all stages, and were associated most strongly with use of social network (SN) and instant messaging (IM), and by fewer participants with shared workspace (SW) and online meetings (OM). In addition, **convenience** (Is9) was mentioned in one interview as a benefit of social network (SN) and shared workspace (SW). Convenience is now incorporated within the construct of saving time. Gimpel et al (2014) found the greatest efficiency benefit came from use of shared workspace, followed by instant messaging, then wikis, and found some impact for all technology types. The results are consistent for instant messaging and, to a lesser extent, for shared workspace. Efficiency as an impact of using a social network was limited in Gimpel et al's (2014) research may be due to differences in the situational characteristics.

Two further benefits associated with efficiency are validated - **reduces the need to physically meet** (Is2) and **driving the project forward** (Is4). A consequence of reducing the need to meet physically would typically be reduced cost of travel as

suggested by Van der Merwe (2016). Use of instant messaging (IM), social network (SN) and online meetings (OM) were associated with reducing the need to meet physically (Is2) and can be recommended to practitioners. Driving the project forward was associated with using instant messaging (IM), social network (SN), and online meetings (OM). Driving the project forward (Is4) was not a benefit found in the literature and can be promoted to practitioners.

Another efficiency benefit is **synchronous editing** (Is3) and this is associated only with a shared workspace (SW). Synchronous editing was not found in the literature and can be suggested to practitioners and software suppliers as an important aspect of shared workspace software and applications. However, the construct of synchronous editing is functionality that enables work to be shared and thus is not considered further as a benefit per se.

Some impacts were perceived negatively and participants suggested there was a potential for the efficiency benefits of using social media to be reduced. Social media can be **distraction** (Is8) was a concern highlighted for instant messaging (IM). This negative perception is a concern about the use of social media for managing projects and can be incorporated into advice for practitioners, and used to develop practices around use of social media that avoids negative impacts.

Perceptions that information was **less concise and less formal** (Is5) in a social network (SN) and instant messaging (IM) were recorded in four interviews. **Tasks being ignored** (Is6) and **losing track of work** (Is7) were mentioned in three different interviews. These three negative perceptions are now consolidated into a single construct of informality. This concern was not mentioned by professionals, perhaps because the boundary between work and social are more blurred for students than for professionals. However, a blurring of the boundary between work and social life was recognised in the literature and these concerns should be considered when developing practice around using social media on projects.

Overall, perceptions of efficiency benefits were discussed in fifteen interviews and concerns were mentioned in seven interviews, although in all these interviews the perception of participants was that the benefits far outweighed the potential disadvantages.



## Quality

A benefit in terms of the quality of work was identified in four interviews, validated and is linked to use of the social network (SN). The social network enabled team members to share work and obtain feedback from others that enabled improvement. This impact on quality was coded as **feedback improves quality** (Iq1). Van der Merwe (2016) suggested that use of social technologies could foster continuous improvement and the finding from this work may explain one way this could happen. Therefore, quality improvement as a benefit of using a social network can be promoted to practitioners.

## Information management

Eight benefits related to information management are validated in this work, as is the one concern of information loss (Im6). Benefits related to information management identified in the literature were quick ad-hoc information sharing (Van der Merwe 2016), and increased speed to access knowledge (Bughin et al 2011). Authors suggested these are benefits of using social media in general and did not highlight specific individual technologies. The eight information management benefits have some similarities with the suggestions made in the literature.

**Faster information sharing** (Im3) and **facilitates informal information sharing** (Im5) were mentioned in four interviews and linked to use of a social network (SN) and instant messaging (IM). In addition, one project manager indicated faster information sharing (Im3) was a benefit of online meetings (OM). These impacts are similar to the suggestions of Van der Merwe (2016) and Remidez and Jones (2012) respectively.

**Easier information sharing** (Im2) is a validated impact mentioned in four interviews, for social network (SN), shared workspace (SW), micro blog (MB) and for sharing videos (VI). **Eliminates duplication** (Im4) and **easy to find information** (Im7) were both mentioned in one interview each, for shared workspace (SW) and social network (SN) respectively. **Information not missed** (Im8) was mentioned in three interviews for social network (SN) and instant messaging (IM). An impact of **eliminates the need to send** [documents by email] (Im1) was mentioned in two interviews, once each for social network (SN) and shared workspace (SW). All five of these benefits are associated with having a single electronic repository for information and documents that is accessible to all team members. The technologies used by different teams may be explained by a selection of influencing factors. All five impacts are consolidated into the single construct of easier information sharing.

**Extends information sharing** (Im7) was discussed in two interviews and is validated. One project manager discussed easier sharing of information by sharing videos and sharing information across the project boundary. Spanning the project boundary was suggested by Remidez and Jones (2012) and is a corollary of a project activity of communication beyond the project team suggested by Harrin (2010a). A consequence of this impact might be a reduction in telephone bills, as suggested by Van der Merwe (2016), and reduced communication costs, as found by Bughin et al (2011).

In addition to the benefits, one concern is validated for information management.

**Information loss** (Im6) was identified in four interviews and is associated with use of social network (SN), instant messaging (IM), shared workspace (SW) and online meetings (OM). Practitioners would benefit from being aware of this risk when planning use of social technologies.

### Flexibility

Three specific impacts are related to flexibility and validated in the present work. Gimpel et al (2014) found a benefit of flexibility but did not define the term, and Van der Merwe (2016) suggested a benefit of social technologies was that information could be provided from any location. An **ability to work in any location** (If2) was one impact found and corresponds with Van der Merwe's (2016) suggestion. The other two impacts were **ability to work in own time** (If1), and **dynamic task allocation** (If3). Gimpel et al (2014) found flexibility was reported most for use of shared workspace and instant messaging, although there was some impact from all technologies. In this work, flexibility was linked to use of four types of technology - social network (SN), shared workspace (SW), instant messaging (IM) and online meetings (OM). Therefore, the findings of this work largely agree with Gimpel et al's (2014) findings, and extend understanding by identifying three aspects of flexibility in the context of using social technologies for managing projects.

### Transparency

Transparency was one of the benefits Gimpel et al (2014) found, but the term was not defined. In this research, three impacts in the transparency category are validated: **all have the same information** (It1), **visibility of work and status** (It2) and **accountability** (It3). Therefore, this work extends understanding of transparency in managing projects. Gimpel et al (2014) found transparency was reported most for use of a shared workspace and newsfeed. In this work, flexibility is linked to use of four types of technology - social network (SN), shared workspace (SW), instant messaging

(IM) and online meetings (OM). Therefore, this work suggests practitioners might increase flexibility by considering use of other technologies.

### **Creativity**

Elie-Dit-Cosaque and Pallud (2012) found collaborative performance was positively correlated with creativity, but the meaning of creativity was not fully explained. Two impacts were interpreted as creativity in the present work: **facilitates sharing of ideas** (Ic1) and **stimulates thinking** (Ic2). Elie-Dit-Cosaque and Pallud's (2012) research did not identify specific types of collaborative technology. The present work found facilitates sharing of ideas (Ic1) is associated with use of a social network (SN), instant messaging (IM), online meetings (OM) and creating and sharing videos and images (VI), and stimulates thinking (Ic2) is linked to creating and sharing videos and images (VI). Hence, this work extends understanding of creativity in the context of using social technologies to manage projects.

### **Emotional impacts**

In the category of emotional impacts, six benefits and two concerns are validated by this research.

An emotional impact of **feeling connected or engaged** (Ie4) was discussed in six interviews, covering all stages, and was linked to use of social network (SN), instant messaging (IM) and online meetings (OM). A benefit suggested by Van der Merwe (2016) was builds community, although the extent of similarity with feeling connected is not clear. This work contributes an understanding of the specific technologies associated with connecting a community.

**Encourages participation** (Ie1) and **increases focus** (Ie2) were impacts discussed in five interviews each, and are interpreted as motivation. In the literature, Gimpel et al (2014) found motivation as a benefit, and Van der Merwe (2016) suggested morale. In the present work, motivation was linked to use of a social network (SN), instant messaging (IM) and, by one project manager, online meetings (OM). The research by Gimpel et al (2014) found motivation was reported as a benefit of using all technologies, and most for use of a shared workspace, but also for instant messaging and social network. Largely, the findings here concur with the work of Gimpel et al (2014) and add to an understanding of motivation as a benefit of using social media.

**Faster trust** (Ie7) was identified as an impact of using instant messaging (IM) and online meetings in three interviews. Trust was found by Gimpel et al (2014, and

suggested by Van der Merwe (2016), Remidez and Jones (2012), and Elie-Dit-Cosaque and Pallud (2012). The finding here was more specific and indicates the impact is building trust faster. Gimpel et al (2014) found trust was reported most as a benefit of using a shared workspace, in contrast to use of instant messaging and online meetings identified here.

**Enjoyment** (Ie3) was mentioned in two interviews for use of a social network (SN), online meetings (OM) and video and image creation (VI). Elie-Dit-Cosaque and Pallud (2012) found satisfaction was correlated with collaborative performance although the extent of similarity with enjoyment is not clear.

One participant in this research suggested that use of a social network (SN) **encourages sensitivity** (Ie8). Sensitivity was not found in the literature and further research is required to investigate this impact.

Three negative impacts were identified from the data. **Fear of overload** (Ie5) was mentioned in two interviews, and **feeling harassed** (Ie9) was identified only by one professional. These two constructs are similar and add to an understanding to information overload as suggested by Van der Merwe (2016). All three constructs are incorporated into a single concern that relates to a fear of overload, in terms of both information and workload, in the findings of this research. This concern should be considered when developing practice around using social media.

Another negative impact was **fear of letting the team down or making mistakes** (Ie6), identified in two interviews. This concern was not identified in previous research and could be shared with professionals to inform development of practice.

Overall, the impacts of using social media for managing projects have been consolidated into twenty-one constructs that are perceived as benefits, and five constructs that are considered concerns, as illustrated in Fig. 5.8.

Finally, all parts of the consolidated framework are combined into a single diagram, as shown in Fig. 5.9. A duplicate diagram is provided for convenience in Appendix I.

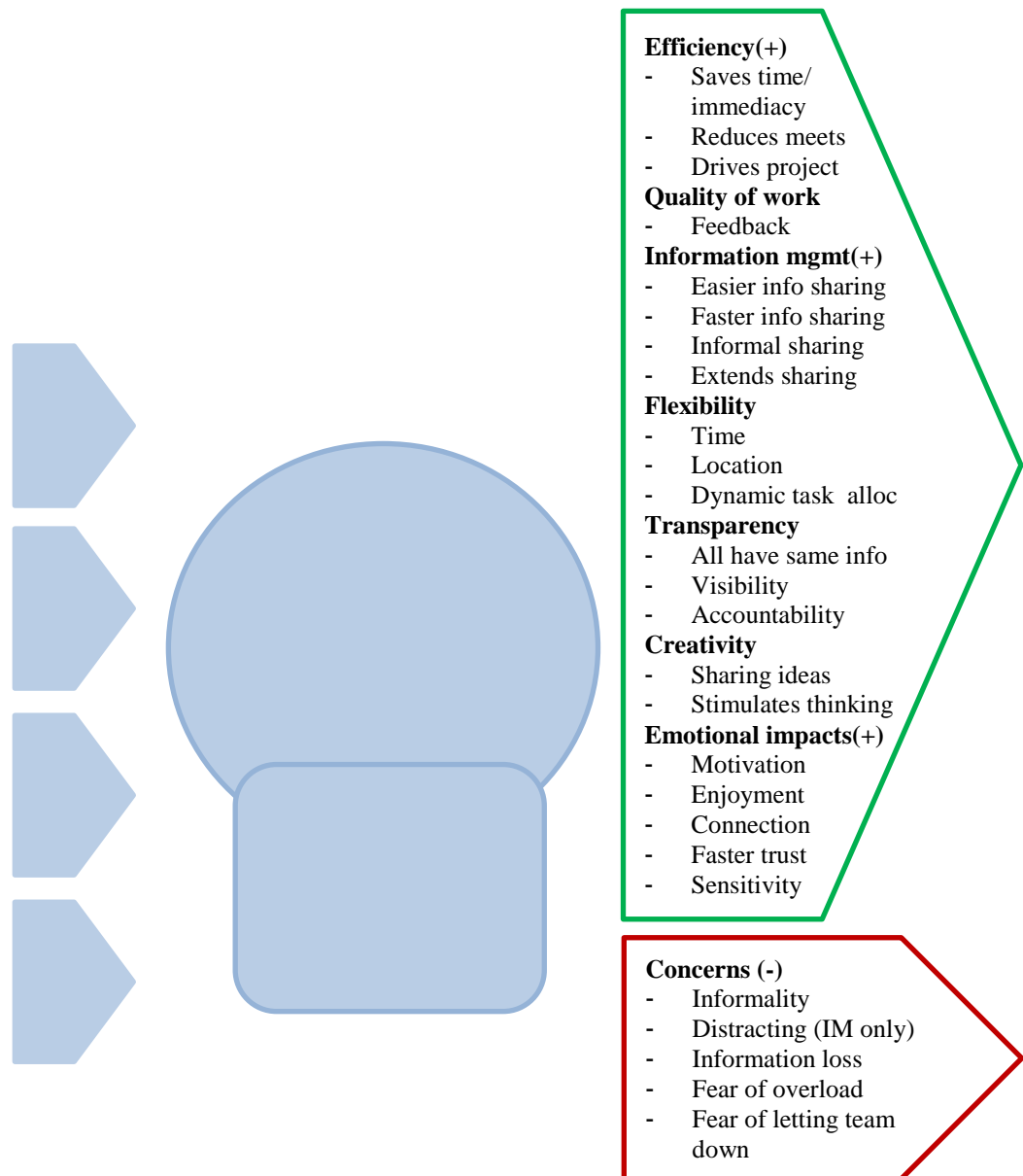


Fig 5.8 Validated and consolidated impacts of using social media in managing projects

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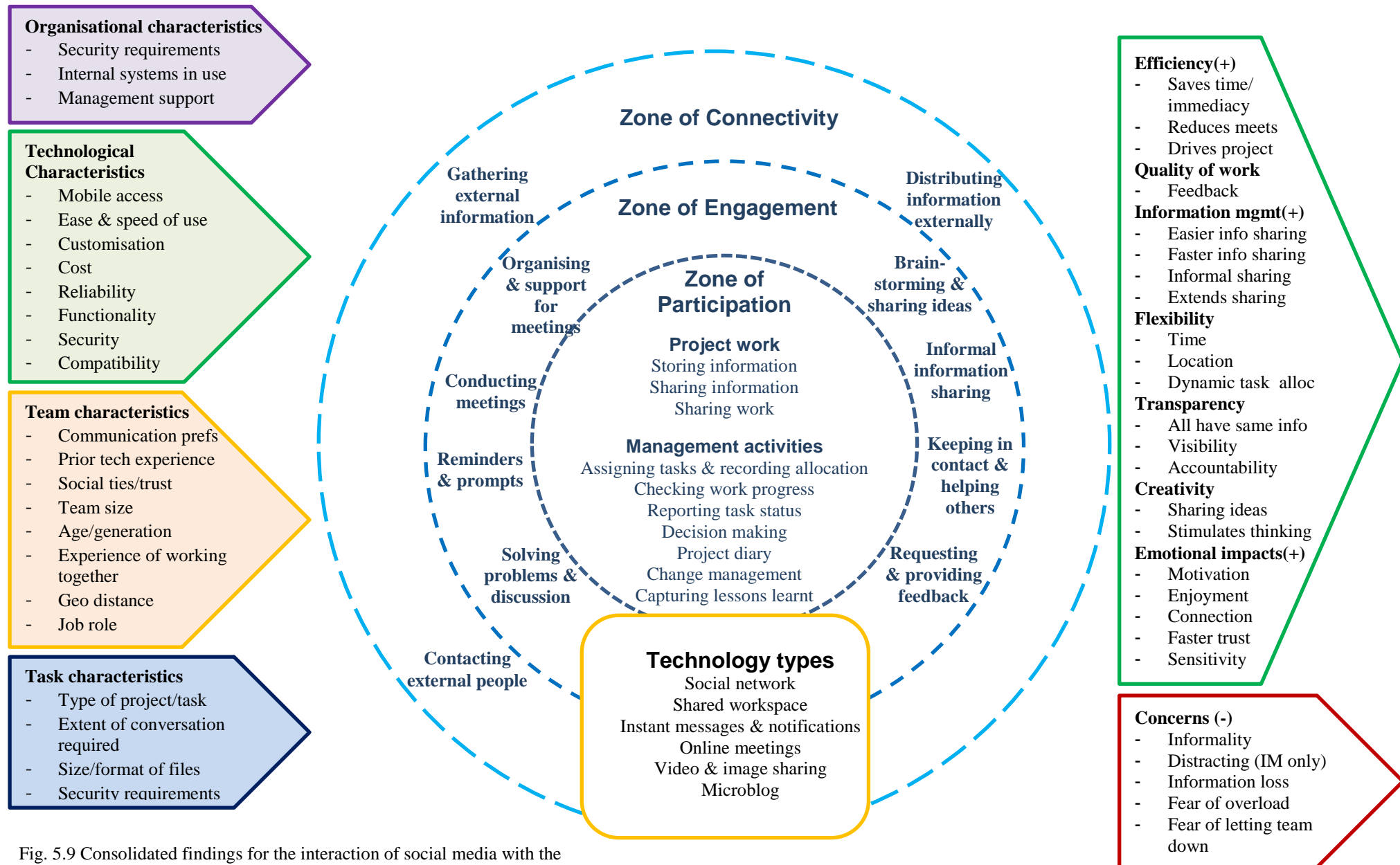


Fig. 5.9 Consolidated findings for the interaction of social media with the practice of project management

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## 5.8 The performance of social technologies in managing projects

Six types of technology were validated in this research and, of these, four types – social network, shared workspace, instant messaging and micro blogs – were similar to the types found by Gimpel et al (2014). Gimpel et al (2014) measured the performance of seven social collaboration technologies in supporting project work. The technologies not found in this work were wiki, newsfeed, blog and events calendar/task scheduling tools; while online meetings, video creation and image sharing were found, but are not mentioned by Gimpel et al (2014). The difference between the findings of Gimpel et al (2014) and this work could be due to the types of projects undertaken or changes in technology in the time that has elapsed between the studies.

Social network and instant messaging were the technologies ranked highest in terms of performance, in this work (Table 4.21). In contrast, Gimpel et al (2014) found the greatest contribution to project work was from a shared workspace, with smaller contributions from instant messaging and social network, as illustrated in Table 5.2.

Table 5.2 Comparison of performance of different technologies

Social technology	This work		Gimpel et al (2014) (% share of maximum possible)
	No. of different benefits	No. of interviews where benefits identified	
Social network	22	12	11.2
Shared workspace	10	11	50.7
Instant messaging	19	15	22.5
Online meetings	11	7	-
Video creation & image sharing	5	4	-
Micro blog	2	1	5.3
	-	-	Wiki (15.6)
	-	-	Newsfeed (9.3)
	-	-	Weblog (7.6)

	Highest ranked
	Second highest ranked

Gimpel et al (2014) measured the performance of individual technologies and found shared workspace contributed more than other technologies for most of the benefits they identified. In the present work, shared workspace was emphasised for activities in

the Project Work category. Social network was also used for all three Project Work activities; instant messaging and online meetings were also used for sharing information and sharing work.

In Gimpel et al's (2014) findings, two notable exceptions were "informal exchange" and "discussion" (ibid., p.14), where instant messaging made the greatest contribution. In the present work, informal exchange and discussion were identified as activities, rather than benefits, and involved social network and instant messaging. This combination of social network and instant messaging were identified for twenty-one impacts, of which seventeen were benefits, and is therefore considered significant.

Technology types working together is particularly relevant for instant messaging. Lync, for example, combines online meetings and instant messaging. A facility for sending notifications from a social network or a shared workspace was highlighted as a functional requirement in interviews and featured in discussions about how technology was used, as illustrated by Team A:

It's like a little tick box and once you've ticked the box it means you've completed the task and it will be removed from your list. ... every time someone finished it I'd get a notification from that, but I can also see who hasn't finished it." (Team A, p.1)

Finally, the activities and impacts validated in this work are organised by technology type, as shown in Table 5.3.

Table 5.3 Activities and benefits by social technology

<b>Social technology</b>	<b>Activities</b>	<b>Impacts</b>
Shared workspace with notifications	<p><b>Project work</b></p> <ul style="list-style-type: none"> <li>• Sharing work</li> <li>• Storing information</li> <li>• Sharing information</li> </ul> <p><b>Management activities</b></p> <ul style="list-style-type: none"> <li>• Status updates</li> <li>• Project diary</li> <li>• Change management</li> <li>• Capturing lessons learnt</li> </ul>	<p><b>Benefits</b></p> <ul style="list-style-type: none"> <li>• Saves time</li> <li>• Easier knowledge sharing</li> <li>• Flexibility – location</li> <li>• Flexibility – time</li> <li>• Transparency</li> <li>• Feeling connected</li> </ul> <p><b>Concerns</b></p> <p>Risk of information loss</p>

<b>Social technology</b>	<b>Activities</b>	<b>Impacts</b>
Social network with instant messaging & notifications	<p><b>Engagement activities</b></p> <ul style="list-style-type: none"> <li>• Organising &amp; supporting meetings</li> <li>• Informal information sharing</li> <li>• Requesting &amp; providing feedback</li> <li>• Reminders &amp; prompts</li> <li>• Understanding &amp; solving problems</li> <li>• Keeping in contact &amp; helping others</li> </ul> <p><b>Project work</b></p> <ul style="list-style-type: none"> <li>• Sharing &amp; storing information</li> <li>• Sharing work</li> </ul> <p><b>Management activities</b></p> <ul style="list-style-type: none"> <li>• Assigning &amp; recording tasks</li> <li>• Checking work progress</li> <li>• Status updates</li> <li>• Decision making</li> <li>• Project diary</li> <li>• Change management</li> </ul> <p><b>Communication beyond the project</b></p> <ul style="list-style-type: none"> <li>• Gathering information externally</li> <li>• Contacting external people</li> </ul>	<p><b>Benefits</b></p> <ul style="list-style-type: none"> <li>• Saves time</li> <li>• Reduces need to physically meet</li> <li>• Drives project forward</li> <li>• Feedback improves quality of work</li> <li>• Easier knowledge sharing</li> <li>• Faster information sharing</li> <li>• Informal information sharing</li> <li>• Extends information sharing</li> <li>• Flexibility – location</li> <li>• Flexibility – time</li> <li>• Flexibility – task allocation</li> <li>• Transparency</li> <li>• Creativity</li> <li>• Feeling connected</li> <li>• Motivation</li> <li>• Faster trust</li> <li>• Enjoyment</li> </ul> <p><b>Concerns</b></p> <ul style="list-style-type: none"> <li>• Informality</li> <li>• Can be distracting</li> <li>• Risk of information loss</li> </ul>
Online meeting with instant messaging	<p><b>Engagement activities</b></p> <ul style="list-style-type: none"> <li>• Conducting meetings</li> <li>• Informal information sharing</li> <li>• Requesting &amp; providing feedback</li> <li>• Reminders &amp; prompts</li> <li>• Understanding &amp; solving problems</li> <li>• Brainstorming &amp; sharing ideas</li> </ul> <p><b>Project work</b></p> <ul style="list-style-type: none"> <li>• Sharing work</li> <li>• Sharing information</li> </ul> <p><b>Management activities</b></p> <ul style="list-style-type: none"> <li>• Assigning &amp; recording tasks</li> <li>• Checking work progress</li> <li>• Decision making</li> <li>• Change management</li> </ul> <p><b>Communication beyond the project</b></p> <ul style="list-style-type: none"> <li>• Distributing information externally</li> <li>• Gathering information externally</li> <li>• Contacting external people</li> </ul>	<p><b>Benefits</b></p> <ul style="list-style-type: none"> <li>• Saves time</li> <li>• Reduces need to physically meet</li> <li>• Drives project forward</li> <li>• Feedback improves quality of work</li> <li>• Faster information sharing</li> <li>• Informal information sharing</li> <li>• Extends information sharing</li> <li>• Flexibility – location</li> <li>• Flexibility – time</li> <li>• Creativity</li> <li>• Feeling connected</li> <li>• Motivation</li> <li>• Faster trust</li> <li>• Enjoyment</li> </ul> <p><b>Concerns</b></p> <ul style="list-style-type: none"> <li>• Risk of information loss</li> </ul>
Video & image sharing	<p><b>Project work</b></p> <ul style="list-style-type: none"> <li>• Brainstorming &amp; sharing ideas</li> </ul> <p><b>Management activities</b></p> <ul style="list-style-type: none"> <li>• Project diary</li> <li>• Capturing lessons learnt</li> </ul> <p><b>Communication beyond the project</b></p> <ul style="list-style-type: none"> <li>• Distributing information externally</li> </ul>	<p><b>Benefits</b></p> <ul style="list-style-type: none"> <li>• Easier knowledge sharing</li> <li>• Extends information sharing</li> <li>• Transparency</li> <li>• Creativity</li> <li>• Feeling connected</li> <li>• Enjoyment</li> </ul>
Micro blog	<p><b>Communication beyond the project</b></p> <ul style="list-style-type: none"> <li>• Distributing information externally</li> <li>• Gathering information externally</li> </ul>	<p><b>Benefits</b></p> <ul style="list-style-type: none"> <li>• Saves time</li> <li>• Easier knowledge sharing</li> </ul>

Table 5.3 Activities and benefits by social technology (contd.)

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## 6 Conclusions and contributions to knowledge

### 6.1 Introduction

The theory and practice of project management are evolving rapidly and this work is situated within a third wave of project management (Morris et al 2011). Growth of mobile technologies and increasing use of social media in the workplace, combined with diverse views among project management practitioners, prompted the question: how do social media interact with the practice of project management?

The work began by considering traditional approaches to project management. Conventional approaches are used extensively in practice and yet have been widely criticised. An objectivist stance and emphasis on planning are key criticisms of project management as it is practiced today. Conceptions underlying conventional approaches to project management tend to ignore the socially constructed nature of projects. Dalcher (2016b, p.2) comments:

“New technologies, including social media; an increased focus on sharing assets, platforms and even work tasks; and agile and lean work practices offer new possibilities.”

Hence, this work began by re-conceptualising projects as learning organisations and exploring communication in project management. New definitions for a ‘project’ and ‘project management’ were developed. Project communication, usually viewed as either internal among team member or outwards to inform external stakeholders about the project, was conceptualised in a new framework of three zones.

Social media were defined using a socio-technical perspective. It is argued that digital natives think and process information differently from their predecessors (Premsky 2001). Therefore, the participants chosen for this research were digital natives, whose experience of using social media pre-dates their experience of project management. An abductive strategy and a qualitative, bottom-up approach were used to uncover the behaviours and perceptions of how digital natives actually manage projects.

The primary research question has been addressed in terms of four aspects of the interaction among social media and project management practices: types of technology used, factors influencing use of social media, activities where social media is deployed, and perceptions of the impacts of using social media in project environments.

Diverse perspectives amongst practitioners were highlighted, from those who see a perfect match between project management and social media (e.g. Harrin 2010, O'Neal 2010), to those who ask if social media are a waste of time (APM 2014). Perceptions of the impacts of using social media in project settings were explored and shed some light on the dichotomy of views. Seven categories of impacts were revealed. In all categories, positive impacts, referred to as benefits, were identified and a total of twenty-one constructs were defined and validated. In addition, in three of the categories, negative perceptions were detected and a total of five concerns were validated. Hence, the positive perceptions of using social media far outweigh the concerns, among digital natives using social media to manage projects. Social media are certainly not perceived to be a waste of time for managing projects, but neither is it a perfect match. There is a more nuanced discussion of perspectives of this dichotomy in the final part of section 6.2.

There are two further sections in this chapter. Section 6.3 addresses the contributions of knowledge that go beyond the central question. Finally, section 6.4 identifies the implications of this work for the practice of project management, highlights the limitations and makes suggestions for further research.

## **6.2 Contribution to knowledge of social media in project management**

Previous research on how social media are used by co-located teams to manage projects is very limited. The only empirical academic research involving practitioners that has been uncovered is Gimpel et al (2014) and this has yet to be peer-reviewed for publication, as far as is known. One limitation of Gimpel et al's (2014) work was that online meetings were not included. Furthermore, the factors influencing adoption and use of technology were not addressed by Gimpel et al (2014) and they did not distinguish between activities and benefits. Another limitation of their work is that the questions were derived from interviews with experts and hence their results are influenced by conventional understandings of project management.

Research has not previously been conducted on the factors influencing the adoption and impacts of social media for managing projects. Existing theory on the factors influencing technology adoption was tested for earlier types of collaborative technology, such as SMS (Brown et al 2010), but not for the range of social technologies included in the present work. Kügler et al (2013) developed a theoretical model for the adoption of ESSP and this research provides support for some components in their model. Uses of social media in business settings have been surveyed by others (Harrin 2010a, 2011b, Bughin et al 2013, Bughin et al 2011) but these studies lack academic rigour.

The present work used a bottom-up, qualitative approach to uncover new knowledge of how digital native practitioners are actually using social media to manage projects. New behaviours and perceptions are identified in this work. In this section, new knowledge is discussed in relation to each of the objectives in turn.

### **Types of technology**

This research found six types of technology are used, compared to the nine types suggested in the literature. Activities have been correlated with types of technology (see Table 5.3) and represents new understandings of how social media can be used effectively. In addition, the benefits that can be expected from using each type of technology are indicated. Concerns are highlighted for each type and such knowledge can be used to guide good practice advice for practitioners.

## Influencing factors

Theory from the mature field of technology adoption was used to suggest a range of factors that might influence use of social media in project settings. The literature on technology adoption and use tends to be based on case studies on individual technology in a specific organisational setting and, with the exception of Kügler et al (2013) pre-dates widespread personal use of social media. In many of the case studies, use of technology was driven by an organisation from the top down, and project management was not a focus. In the present work, the qualitative, bottom-up approach enabled perceptions to be uncovered about the factors influencing adoption and use of social media specifically for managing a project.

Four types of factors were found to influence the adoption and use of social technologies in a project setting. Characteristics of the **organisation** may completely prohibit the use of social technologies altogether for security reasons, or where established internal systems are prescribed for communication and project management activities. Brown et al (2010) modelled factors for the adoption and use of collaboration technology, rather than social media per se. The organisational characteristics identified in this work are similar to the situational characteristics identified by Brown et al (2010), so this work confirms the influence of situational characteristics for social media.

Perceptions of characteristics of the **technology** also bear strongly on how social technologies are used. The two most significant perceptions are ease of use and mobile access. Ease of use was identified in previous research (e.g. Brown et al 2010) although in this work extends understanding to include speed of use. Mobile access is a new factor found in the present work. Other new factors identified here are perception of security, customisation, cost, and reliability.

Characteristics of the **team** have a significant influence on the adoption and use of social technologies. The majority of participants in this research were in the 20-25 age group and their experience of using social media pre-dates their experience of formally managing projects. Accordingly, they have difficulty conceiving a project without social media and they have developed communications preferences and habits around social technologies before engaging with project management. Communication preferences, along with team size, geographic distance and job role, were not identified in the literature and therefore are new factors that extend understanding of the use of social media on projects.



Characteristics of the **task** was the fourth type of influence on the use of social technologies. The extent of conversation required was the characteristic found to influence use of technology. The other new influences found were corollaries of perceptions of the technology i.e. security requirements and the format and size of the files involved in the task.

Overall, this work adds to an understanding of the factors that influence adoption and use of social media on projects, and ten new factors are identified.

### Activities

Twenty-one activities were found and grouped into four types. In the previous chapter, correlations between the activities identified in the conceptual framework and the activities identified from the data were discussed. Generally, the activities identified from the data correlated well with those in the conceptual framework and, for some, extend understanding of the activities actually undertaken when managing projects.

This research separately uncovered activities and impacts. In comparison, Gimpel et al (2014) identified a range of benefits that were only separated into activities and impacts in this work. Ten activities were identified by Gimpel et al (2014) and twenty-one were found by this research. All ten of Gimpel et al's (2014) activities are reflected in the findings of this work. In addition, the twenty-one activities have been grouped into four categories, hence reaffirming and adding depth and breadth to the findings of Gimpel et al (2014).

Social technologies were involved in **project work** by enabling collaboration and three activities were identified: sharing and storing information and sharing work. Most importantly, this research shows how social technologies enable sharing of tacit knowledge as well as explicit knowledge. Tacit knowledge "needs the key mechanisms of interaction and feedback for effective sharing and use" (Sandhawalia and Dalcher 2014, p.803). The findings in this work show how social media can provide mechanisms that extend information sharing to include tacit knowledge.

Seven **management activities** involving social technologies were identified. Five of the activities are associated with a traditional view of project management. Change management and capturing lessons learnt are the other two activity and they reflect the fourth direction identified by the Rethinking Network (Winter et al 2006a, p.642):

"a broader conceptualisation of projects ... not always pre-defined, but permeable, contestable and open to renegotiation throughout."

Capturing lessons learnt and sharing with the wider project management community was identified by the APM (2014) but the lessons learnt activity identified in this work was primarily concerned with sharing learning amongst the team. Capturing lessons learnt is important for sharing learning and for closing the gap between theory and practice. Learning and feedback that is dominated by declarative and explicit knowledge is likely to involve a single feedback loop (Argyris and Schön 1974). Single-loop learning emphasises techniques and improving efficiency (Thompson 2009, Thompson 2005, Argyris and Schön 1974). However, when results are unexplained, there is a need for double-loop learning, involving questioning assumptions and learning that is more creative and reflexive (Thompson 2009, Argyris and Schön 1974). Double-loop learning necessitates sharing tacit, causal knowledge and this work has uncovered an interaction between social media and project activities that facilitates team learning.

The other two categories of activities – engagement and communication across the project boundary - are not represented well in existing project management literature. These categories were identified by importing theory from the fields of knowledge management and organisational learning, and are correlated with the Zones of Engagement and Connectivity respectively, from the conceptual framework

A set of activities that are concerned with human interaction amongst those participating in a project have been identified and are referred to collectively as **engagement activities**. In the conceptual framework, six activities were identified in the Zone of Engagement. Eight engagement activities have been validated and therefore this work extends understanding of the engagement activities occurring on projects. Furthermore, the immediacy of communication provided by the combination of mobile devices and social technologies enables patterns of communication to be developed that engage individuals with a project in ways that go beyond more traditional communication media such as reports and face-to-face meetings. Social media provide opportunities to extend project communication in ways that enable subjective knowledge sharing by socialisation and internalisation. Or, as one participant explained, to “fill in the gaps” (Team B, p.8).

The fourth category of activities is concerned with **communication across the project boundary** that also is not widely discussed in project management literature. Activities that extend project communication beyond a traditional project boundary are essential for organisational learning. Organisational learning is vital if a project is to remain connected with its environment and deliver value for the organisation. Seven activities

were identified for the Zone of Connectivity in the conceptual framework, but only three activities were uncovered by this research. One activity in the conceptual framework - sourcing expertise (Gimpel et al 2014, APM 2014) – corresponds to the activity contacting external people (Ab3). The six other activities indicated in the conceptual framework suggest purposes for the other two activities found - gathering external information (Ab2) and distributing information externally (Ab1). Thus, the purposes suggested for distributing information are sharing the project vision, stakeholder management, and to facilitate adapting to change. The purposes suggested for gathering external information are scanning, surfacing resistance, stakeholder management and gathering feedback, lessons learnt and best practices.

In addition, social media provides opportunities to extend information sharing beyond the project and beyond the types of declarative knowledge that is conventionally shared. Social media facilitate sharing of causal knowledge among a wide audience.

### **Benefits and concerns**

Twenty-one benefits and five concerns were identified as impacts of using social media for managing projects. In comparison, six benefits were identified by Gimpel et al (2014) and another two benefits and one concern from other literature. Hence, this research adds depth and breadth to understanding of the impacts of social media on projects.

Gimpel et al (2014) identified **efficiency** and productivity as benefits, whereas here three impacts were identified within the category of efficiency and four under information management. Gimpel et al's (2014) are confirmed and understanding is extended by the impacts identified: efficiency is constructed here as saving time, reducing the need to meet physically, and driving the project forward.

**Quality** was not found by Gimpel et al (2014) although Van der Merwe (2016) suggests social media can foster continuous improvement. This research confirmed Van der Merwe's (2016) suggestion of social media improving the quality of work through access to feedback.

Van der Merwe (2016) suggests a benefit of quick, ad-hoc **information sharing** and Bughin et al (2011) found a benefit of speed to access knowledge. Here four impacts – easier, faster, informal and extended information sharing – were found, thereby confirming and extending previous understandings.

**Flexibility** was identified by Gimpel et al (2014), and Van der Merwe (2016) suggests information can be provided from any location. This work found social media provided flexibility in terms of time, location and dynamic allocation of tasks. Hence, Gimpel et al's (2014) findings and Van der Merwe (2016) suggestion are confirmed and extended.

**Transparency** was a benefit identified by Gimpel et al (2014), and the concept is extended by this work. Here transparency is constructed as all having the same information, visibility of work and project status, and accountability.

Elie-Dit-Cosaque and Pallud (2012) identified **creativity** as a benefit of using technology, not specifically social media. This research found a benefit of creativity, expressed as facilitates sharing of ideas and, for creating and sharing images and videos, stimulates thinking.

Gimpel et al (2014) found motivation and trust were benefits of using social media. This research found five benefits that extend understanding of the **emotional impacts** of using social media on projects. Encourages participation is considered to correspond with motivation, and so confirms Gimpel et al's (2014) finding. Feelings of enjoyment and connection were identified here and extend understanding of the emotional dimension. This research found trust was developed faster using social media and it is unclear whether this supports or extends Gimpel et al's (2014) finding. Information overload was suggested by Van der Merwe (2016) and is supported here. Fear of letting the team down was another concern uncovered by this research. Lastly, this research found that social could encourage greater sensitivity and this was not identified in previous work.

Overall, the benefits of efficiency, quality, improved information management, flexibility, transparency, creativity and motivation were all suggested in the literature and are supported here. In addition, understanding of the concepts is extended and some new impacts are indicated.

### **Perfect match or a waste of time?**

Overwhelmingly, the participants in this research perceived the impact of social media on project management to be beneficial. Social media are definitely not considered a waste of time by students, and this view was shared by early career project managers and experienced professionals, but neither is the match viewed as perfect.

Twenty-six perceptions of impacts of using social media were validated and of these, twenty-one were considered beneficial. This work found that students and early career project managers cannot imagine a world without the connectivity of mobile technologies and social media, thereby confirming Howard-Jones' (2011) view of everyday lives immersed in technology and connectivity. The twenty-one behavioural constructs identified in this work were validated by professional project managers, suggesting some similarities between the use being made of social media by students and professionals.

Five concerns were raised in relation to use of social media for managing projects. For the student participants, some concerns may be a function of blurred lines between their social domain and the project. One team addressed the concerns by using different social technologies for their project and for their social life. They achieved the benefits of social media hyper-connectivity and yet kept their two worlds separate. The concern about losing information can be related to the way some technology is used. Specifically, social media with a high degree of concurrency, as discussed by Brown et al (2010), can lead to information being lost. Some professionals described the work-arounds they have developed to ensure information is not lost, and important information is correctly recorded. The potential for social media to be distracting was discussed, particularly for instant messaging and notifications. The capability to customise use, for example turning notifications off, enabled participants to overcome this concern. All participants who mentioned concerns, considered the benefits far outweighed the concerns.

Variations in practice were uncovered between those working in a professional setting, including early career project managers, and students. General theory on technology adoption and use, combined with collaborative constructs, was used to understand the factors influencing choice and use of social media. As predicted, four categories of factors were found and the categories correspond with the four in the conceptual framework. Although technology adoption and use is a mature field of research, previous research largely reflects technology driven by an organisational. A key difference today is that social has become ubiquitous in the social realm and hence lack of familiarity with technology is less of an issue. However, factors such as age, and prior experience with a specific technology were validated as influencing factors for use of social media.

Variations between the perceptions of students and professional project managers are explained, in part, by differences in age and experience. More importantly however,

there are also wide variations in the organisational settings for projects. Gimpel et al's (2014) research involved experienced project managers and they found social technologies were not well received. In contrast, those whose experience of social media pre-dated their project experience take social media for granted as an integral part of their practice.

Overall, it seems likely that use of social media on projects will increase as a younger generation who grew up with social media enter the workplace. This work provides a contemporary perspective that adds depth and breadth to the findings of previous research.

### 6.3 Other contribution to project management knowledge

There have been calls for significant rethinking within the discipline of project management (e.g. Winter et al 2006a) and yet much remains unchanged. Professional bodies of knowledge are a significant barrier to change and “research still plays a very limited part in refreshing, informing or supporting the content” (Dalcher 2016a, p.813).

“Radical improvement in our understanding thus depends on the ability to reconceive and re-conceptualise project situations in new and meaningful ways.” (Dalcher 2016a, p.804)

#### New definitions

This work departed from the formal bodies of knowledge and began by re-defining projects and project management practice from a socio-technical perspective and emphasising human interaction. Moving away from the ideas of projects as input-output processes, a new definition of a project was created that embraces Boulding’s (1956) view of organisations as a set of roles:

A project is defined as a temporary set of roles tied together by channels of communication to achieve purposeful change.

Existing definitions of project management that emphasise planning and control were similarly rejected, and a new definition of project management practice was created that reflects Turner’s (1999) notion of turning vision into reality:

Project management practice is the art and science of achieving purposeful change by enabling communication, coordination and integration among temporary roles to convert vision into reality.

The new definitions were developed for this work and have proved useful in extending the understanding of projects and project management beyond a purely objectivist reality. These definitions acknowledge the socially constructed nature of projects, and the complexity of human interaction involved in managing projects, to an extent that previous definitions have not.

This research then conceptualised projects as learning organisations and developed a framework for understanding project communication in three zones.

### **Three zones of project communication**

Traditionally project communication is considered either internal, within the team, or external, with stakeholders who are outside a project boundary. Here, three zones, where communication has different purposes in each zone, are conceptualised and is novel.

Theory on organisational learning indicates three stages and two feedback loops are required to connect an organisation to its environment (Daft and Weick 1984). Three steps and two feedback loops are also indicated by double loop learning (Argyris and Schön 1978). These constructs, along with the notions of situated learning (Wenger 2000) and communities of practice (Lave and Wenger 1991, Oborn and Dawson 2010) have been synthesised and applied to managing projects as learning organisations. Distinct purposes of communication in each of the three zones have been identified and this has not been done before.

In this work, three zones of project communication have been very useful in analysing project behaviours. Communication inwards, to bring information into the project, has been highlighted. In addition, the role of communication that goes beyond an objectivist reality, and incorporates the subjectivity of perceptions, beliefs and values in knowledge sharing has been uncovered. The importance of social communication on projects is suggested by Taylor (2016) and is confirmed by this work.

### **The actuality of managing projects**

This work used a bottom-up, qualitative approach that recognises the socially constructed nature of projects to uncover new knowledge of practice. The focus of the interviews was the deployment of social media, and therefore the activities identified do not necessarily reflect all project activities undertaken. However, the conceptual framework was developed using an inclusive approach that incorporated communication activities suggested by literature on project management, as well as the literature specifically on social media in projects. Therefore, the extent of similarity between the activities in the conceptual framework and those discussed in interviews suggests the list of activities may be reasonably comprehensive. In addition, the extent of similarity indicates that hyper-connectivity is a feature of modern project management practice, particularly among digital natives. Howard-Jones (2011, p.5) suggests “our lives have become increasingly immersed in technology” and this work supports such a view.



### **From 'command and control' to 'convene and coordinate'**

Traditional approaches to project management emphasise planning and control. Communication in project management tends to assume a deterministic view and can be characterised as 'command and control'. Conventional management activities, along with communication activities required for project work, are associated with the Zone of Participation in the conceptual framework. In contrast to 'control', collaboration is highlighted in previous work on the use of social media and is confirmed in this research by the three activities in the category of project work. The management activities validated in this work suggest a more participative approach, for example dynamic task allocation, than might be expected in a traditional command and control approach. Understanding of the management activities previously suggested for social media is extended by the findings from this research.

Viewing a project as a learning organisation highlights a requirement for communication to engage participants both cognitively and emotionally with the project endeavour. Communication to engage participants goes beyond simply organising work, as in a conventional approach, and social media can provide diverse ways for individuals to engage with a project.

Engagement and interpretation activities do not typically receive attention in conventional project management. Eight engagement activities are validated in this research and six were previously identified in literature on social media in project management. Two new activities identified in this work are: requests, reminders and prompts, and keeping in contact and helping others. The engagement activities highlight the importance of human interaction in projects and suggest such activities are essential in managing projects.

Management of a learning organisation has different requirements for communication from those emphasised in a conventional 'command and control' approach to project management. Managing projects as learning organisations requires a different approach. This research suggests social media can provide opportunities for communication to facilitate organisational learning on projects. In contrast to 'command and control', managing projects as learning organisations can be characterised as 'convene and coordinate'.

### **Knowledge management**

New knowledge is created during a project and managing knowledge is essential for project success (Reich and Wee 2006). Theory on knowledge management indicates

four processes are required for the successful transformation of knowledge between individuals and the organisation. Traditional approaches to project management do not address two of the four processes (Reich and Wee 2006). This research shows, for the first time, that deployment of social media on managing a project addresses all four knowledge management processes. Engagement activities, in particular, are associated with the two processes not addressed by traditional project management.

Conventional approaches to project management give little attention to transferring knowledge across the project boundary. Agile approaches go some way towards addressing the shortcomings of traditional project management, typically by co-locating the team and other stakeholders, holding regular meetings, using short timeframes etc. However, even an agile approach is limited by the project boundary defined at the outset and an emphasis on control. One result is that projects become disconnected from their environment and are unable to respond to change.

Three constructs for activities are identified in the Zone of Connection. All three constructs are concern with transferring knowledge across the project boundary. In a conventional approach, project communication tends to flow outwards from the project. Viewing a project as a learning organisation highlights a requirement for information to flow into a project from the environment. This research provides evidence of practitioners using social media to exchange information across the boundary in both directions. Hence, social media provides opportunities for communication between the project and its environment, and this work can be used to encourage information flow, both outwards from and inwards to the project.

### **Methodological contribution to research on projects**

Previous research on project management has often used a deductive approach and quantitative data, and has been widely criticised (e.g. Blomquist et al 2010, Hodgson and Cicmil 2006). In particular, the relevance of project management research to practice has been limited (Maylor and Söderlund 2016). The present work used a bottom-up, qualitative approach that recognises the socially constructed nature of projects to uncover new knowledge of practice.

This research embraces “the continuum of ontological perspective” (Bredillet, 2016, p.47) and, as such, is novel in the field of project management. The abductive strategy involved interrogating practitioner narratives, rather than using structured interviews to generate data. A requirement to move between lay accounts and theoretical

explanations started with the lay accounts rather than theoretical constructs. In this way, the work makes a methodological contribution to project management research.

Drawing insights from observations arising from the data has been used elsewhere (e.g. Burke et al 2014) but recursive data abstraction is not well documented as a method of analysing qualitative data. The approach described by Polkinghorne and Arnold (2014) has been used by three others (Guzys et al 2017, Haines et al 2016, and Jivaketu 2015) but they do not indicate whether the technique was followed as stated, or adapted. For this research, the technique was adapted and applied successfully. The adaptations made for this work may be useful for other research in the future.

Lastly, social media has been used as a lens through which behavioural constructs have been developed and the interaction with social media examined. Behaviours and perceptions of social media and perceptions of what practitioners actually do have been revealed. Using social media as a research lens to examine the actuality of practice may be transferable to other fields.

## 6.4 Implications, limitations and further research

Project management and social media are evolving. Currently, project management practice is heavily influenced by traditional emphases of planning and control, as reflected in professional literature, such as APM (2012). A professional who provides a professional commentary on social media for project managers, Harrin (2010a, p.16) suggests the “project management function hasn’t moved on at all”. Research on social media in project settings is limited and has, to date, relied largely on expert practitioners who are, to some extent at least, constrained by traditional ways of thinking about project management. APM (2014) conclude that social media is “just another suite of channels to do things project managers have been doing for years”.

This research uncovered new behaviours and perceptions of using social media to manage projects amongst a generation whose experience of social media pre-dates their experience of managing projects. The findings of this work provide insights into how the communication paradigm is changing.

### Changing the communication paradigm

The characteristics of project communication used by Müller (2003) are media, frequency and content. All three characteristics are transformed by social media.

Social media increases the choice of media available for project communication. One reason cited for lack of success in using a blog was that effort was required to find the information. Another is habit. The success of instant messaging and social networks is attributed, in part, to speed and ease of use, because individuals are already using the medium for personal use. These findings are consistent with ease of use as a factor that influences use (Kügler et al 2013, Brown et al 2010, Venkatesh et al 2003). Social media are now ubiquitous and there is the potential to choose media for project communication that people are already using, rather than expecting them to foray into unfamiliar technologies. Taking project communication to the places that people already inhabit minimises the learning curve, making communication easier.

Frequency of communication has been transformed. The most frequent communication suggested by Müller (2003) was daily. In contrast, social media, particularly when accessed on mobile devices, enable almost instant communication. Users can customise their devices and applications to receive notifications of updates, read receipts provide message senders with confirmation that communication has been received. Accessibility on mobile devices and ease and speed of use were the most frequently mentioned factors and, viewed together, bear upon immediacy and

concurrency, that were factors identified by Brown et al (2010). One concern validated in this research is that the frequency of communication can mean social media is perceived to be distracting. Practitioners need guidance on how to use social media in ways that minimise distraction. Another concern is fear of overload. Choice of medium and frequency of communication need to be considered to avoid practitioners feeling overloaded. In addition, practitioners need to develop capabilities and tactics around using social media such that they avoid feeling overloaded.

The content of communication is also transformed by social media. The dominant paradigm for communication in project management has been documents and reports. Use of social media to share images and videos, with or without textual narrative is commonplace. Size and format of files is a technological and task characteristic that influences use of social media. In addition, links to videos, images or other web site content are easily shared on social networks. Communication content is no longer restricted to narrative - text in documents and voice in phone calls. Content in the form of graphics, audio, images and videos can easily be created and shared using links to web-based material over social networks, instant messages and other social technologies. Online meetings enable audio and visual content to be created and shared in real time.

In conclusion, the findings from this work can be used to develop good practice guides for using social media in project environments. The four types of influencing factors need to be considered by project managers before deploying social media. Suggestions for how different technologies are shown in Table 5.3. The mapping of different technologies to a range of benefits and concerns, also in Table 5.3, can be used to manage expectations to develop good practice guidelines.

The findings are applicable in all project settings. Such generalisability is made possible because of the wide range of influencing factors that were identified. For example, security requirements of the organisation (Fo1) was identified as a factor that influences use of social media on projects, therefore an organisation where security policy prohibits use social media is reflected in the findings. Another example is that age / generation (Fm5) was identified as an influence, therefore effect of the limited age range of most participants is not considered a limitation to the validity of the work and the extent that the findings can be generalised. However, there are some limitations to the work and these are discussed next.

## Limitations

One limitation of this work is the self-selection of the participants. Although the invitation to be involved in the research did not mention the quality of the project deliverables, outcomes, or teamwork, it could be that only those whose experience was largely positive volunteered. If this was the case, the results may have a positive bias, meaning that there may be other concerns and drawbacks of using social media in project settings that have not been identified. However, not all the experiences discussed by participants were positive and a wider range of concerns, and more specific details of the drawbacks were identified than found in previous work. Gimpel et al's (2014) work, for example, focused only on the benefits. Further research is required to examine the concerns in more detail and with a wider range of participants.

Another limitation of the research is that the majority of participants were university students, working on projects in a single HEI setting. Although the field site provided an opportunity to minimise variation in the organisational setting, there were limitations. One limitation arising from the setting that was uncovered during validation was that students were not necessarily aware of some social media already used by practitioners in commercial settings. Another factor causing a similar limitation is the time frame. Between starting the research and concluding, some technologies are now available to practitioners that were not available at the outset. Hence, a wider range of technology, influencing factors, activities, and perceptions of impacts may now be relevant in commercial settings. Further research would be useful to extend the understandings presented here.

A potential limitation of using students is their lack of professionalism and lack of commercial awareness. However, the students of today are the project managers of tomorrow, and the field site was carefully chosen for its links with businesses, the opportunities for students to work with external organisations and its reputation for developing highly employable graduates. Furthermore, it has been argued that practices in many aspects of business are changing as social media savvy young people make up a growing proportion of the workforce.

Most of the projects discussed in this work were undertaken by teams of 3-5 people in an HEI setting with no, or very little, monetary budget. Cost, time and quality are widely considered important project constraints to be managed. Most student projects have little or no actual cost to be managed, and therefore are different to most commercial projects. The impact of a zero budget is unclear, however, managing a project with no budget might be more or less challenging than managing a project with

a budget. Most student projects have a time constraint with no tolerance i.e. an immovable deadline. Not all projects have a fixed timeframe, but some do, and this may make a project more or less challenging to manage. Quality is the third project constraint commonly managed. Where student projects are formally assessed, quality is a concern because one focus for students is the grade. Therefore, although most projects took place in an HEI setting, the 'triple constraint' is applicable and the findings of this research are relevant beyond HEI settings. Furthermore, the participants in stages three and the validation stage discussed projects in a range of organisational settings. Hence, the findings are applicable to professional project managers across a wide range of industries.

### **Further research**

In addition to the further research suggested above, research would be useful on projects in different industries. This may uncover other technologies and activities that are industry-specific.

Further work that extends diversity of participants would be useful. Diversity of the age of participants could be extended, thereby better reflecting the multi-generational workforce found in many organisations today. Diversity could also be extended in terms of culture. The research site was a UK university and therefore this work was influenced by UK culture and values. The ethnic origin or cultural background of participants was neither identified nor recorded. Project management literature tends to be western world centric and this research is no different. Further research is required to uncover project management practices in different cultures and the impact of different cultures on use of social media.

The focus of this work was communication in project management and the findings provide a foundation for further research on projects, on communication in projects and on use of social media for managing projects. Social processes are an important element in project management and are recognised as a foundation for communication. Research on the role of social processes was outside the scope of this work, and further research is required to understand better social processes in managing projects.

Overall, the findings from this research are highly relevant to professional project managers, as evidenced by the interest expressed during the validation stage. The mapping of activities and benefits against technology types can be used to develop good practice guidelines for use on projects of many sizes and in many industries.

Further research on projects in different industries would be useful to reveal further understanding of the opportunities for, and barriers to, successfully using social media in project management.



## Epilogue

Both project management and social media continue to evolve. In the workplace, social media is no longer the novelty it was when this work began, back in 2010. Alongside rapid technological change, social practices are adapting to exploit new possibilities and are facilitated by an increasingly digital native workforce. What I have learnt about new applications and their use will inform my practice going forward in a very practical way.

In the field of project management, the relationship between theory and practice continues to present a challenge, and calls for meaningful dialogue between researchers and practitioners are growing louder. This work is an example of a meaningful dialogue with successful practitioners that has connected theory with practice.

This research has shown that managing projects as learning organisations involves three stages of communication, with knowledge flowing between the stages, and in two directions. It is particularly gratifying to have built on my early work on the application of double-loop learning to project management (Thompson 2009, 2005).

Communication beyond the project boundary, in particular, is currently neglected (both theoretically and practically) and is one important way that social media can have a beneficial impact on projects.

Social media have a role to play in changing the communication paradigm on projects and emphasising human engagement. Formal and informal communication using social media can transcend the limitations of time, place and content of more traditional and largely text-based forms of communication. Thereby social media have the potential to transform endeavours of 'turning vision into reality' by connecting people to each other and to projects in diverse ways that can inspire, motivate and engage more effectively than more conventional forms of communication.

As a result of this work, I hope to be able to make a useful and relevant contribution to the education and practice of managing projects.

Karen Thompson  
April 2017

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## **Appendix A: Conceptual framework diagram (duplicate)**

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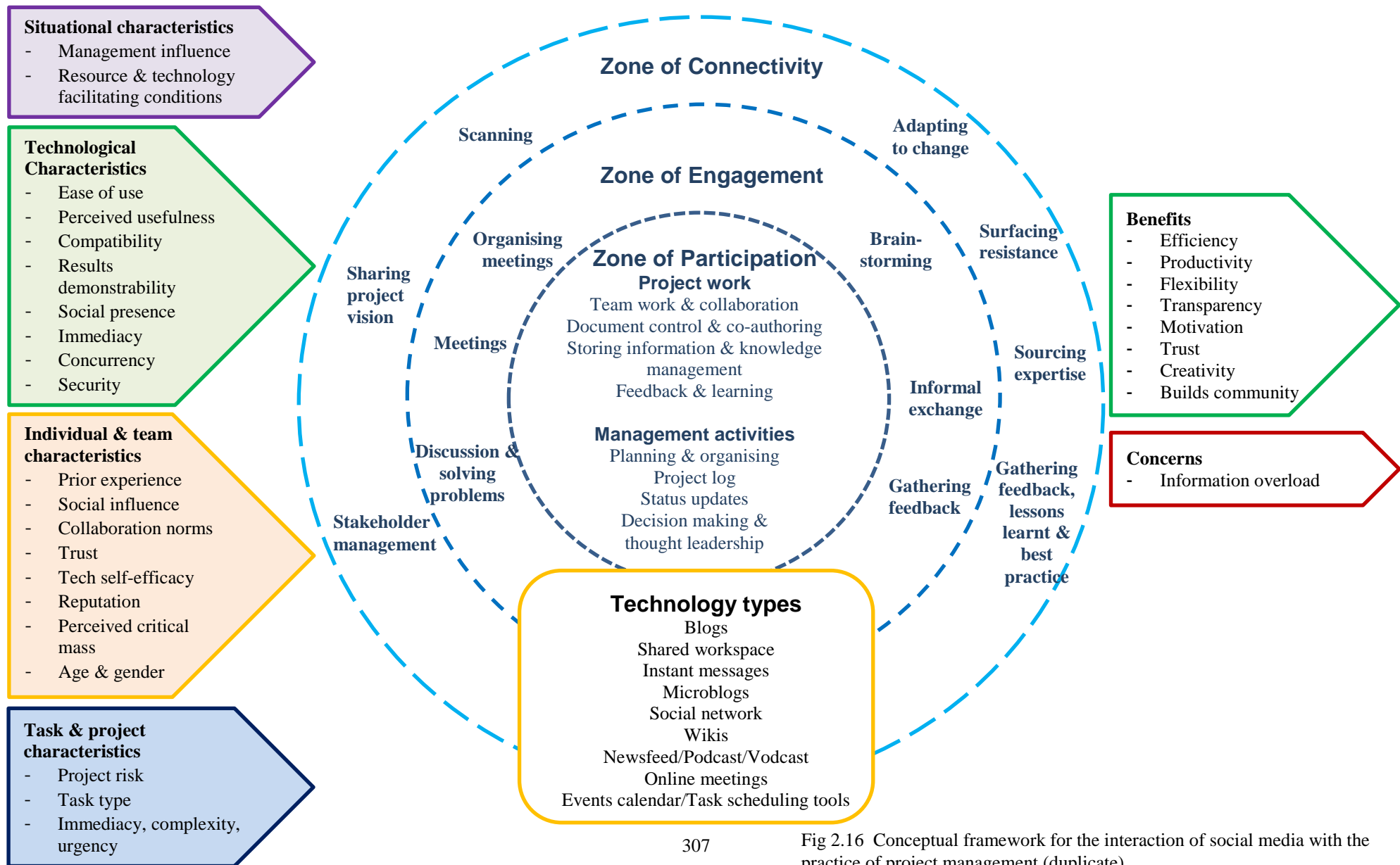


Fig 2.16 Conceptual framework for the interaction of social media with the practice of project management (duplicate)

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## Appendix B: Participant Information Sheet and Consent Form

### Participant Information Sheet The Business School, Bournemouth University

#### An exploration of the prospects for the use of social media technologies in project management, using early adopters as a leading indicator

You are invited to participate in a research study conducted by Karen Thompson. Participation will involve a semi-structured interview lasting 15-20 minutes, with the exact location and time to be arranged for mutual convenience. A pre-interview questionnaire will be used to collect background data.

#### Purpose of the research

The overall aim of the research is to explore the role of social media (Facebook, Twitter, GoogleDocs etc.) in the practice of project management, and may help us to better understand how social media is used in the practice of managing projects. The research objectives are:

1. To investigate what social media technologies are used in project settings and what factors influence their use.
2. To explore how social media technologies are used on projects – when, by whom and what type of information has been involved.
3. To discover the impacts, benefits and consequences of using social media technologies in project communication and management practices.

#### Risks

There are no known risks associated with this research.

#### Potential benefits

This research aims to contribute to an understanding of how social media is used in the practice of managing projects. Participating in this research may lead you to reflect on your own experience and develop your understanding of managing projects. By participating in this research you may also gain a deeper understanding of project management practices and/or the use of social media.

#### Protection of confidentiality

Interviews will be audio recorded and the recordings may be transcribed either partially or in full. Extracts from the interviews will be quoted in the research and used to provide evidence to support the findings. All references to individuals, teams or an organisation will be made anonymous for the purpose of data analysis and reporting. Your identity will not be revealed in any publication resulting from this study. Data will be held securely on a password protected computer, and may also be securely copied for backup purposes. Personal data will be destroyed in 5 years.

#### Voluntary participation

Your participation in this research project is voluntary. You may choose not to participate and you may withdraw your consent to participate at any time until the anonymisation of the data. You will not be penalized in any way should you decide not to participate or to withdraw from this study.

#### Contact information

If you have any questions or concerns about this study or if any problems arise, please contact Karen Thompson at Bournemouth University at [kthompson@bournemouth.ac.uk](mailto:kthompson@bournemouth.ac.uk)

If you have any questions or concerns about your rights as a research participant, please contact the Business School Coordinator of PG Research, Allan Webster:  
[AWebster@bournemouth.ac.uk](mailto:AWebster@bournemouth.ac.uk)

Ethical approval ref. 4616 [Feb 2015]

## **Consent Form for Participation in a Research Project The Business School, Bournemouth University**

**An exploration of the prospects for the use of social media technologies in project management, using early adopters as a leading indicator**

This form confirms your consent to participate in the research study conducted by Karen Thompson identified in the title above.

### **Your participation**

Your participation in this research project is voluntary. You may choose not to participate and you may withdraw your consent to participate at any time until the anonymisation of the data.

### **In the event of a complaint**

If you have any questions or concerns about your rights as a research participant, or if you wish to make a complaint, please contact the Business School Coordinator of PG Research, Allan Webster: AWebster@bournemouth.ac.uk

### **Consent**

I confirm I have read the Participant Information Sheet for this research and have been given the opportunity to ask questions. I give my consent to participate in this study.

Participant's signature \_\_\_\_\_

Date: \_\_\_\_\_

A copy of this Consent Form should be given to you and a copy will be retained by the researcher.

Ethical approval 4616 [Feb 2015]

## **Appendix C: Example of coded interview transcript**

**Stage one: Team B coded transcript**

Team B 3-4-13 1pm. 3 out of 4 team members present. 1 female, 2 males. All 18-25yrs.

I	Um, social media and how you've used that in managing your project and the backdrop to that is communications generally. So, what can you tell me about what you've been using to communicate both internally in the team and externally, with your client and other stakeholders.
Team	I think internally to be honest it's probably been the most key tool to everything we've done / yeah
I	Oh right
Team	Essentially, um, apart from obviously kind of the models and things that we use to actually effectively manage our time, <b>in terms of the day to day stuff, it's [Facebook] the primary source of communication for us.</b> I think we set up a <b>Facebook group</b> way before we even started this year / yeah / Once we decided we wanted to do consultancy project / yeah / ? / it's the way we got together kind of thing / it's the way we got together, it's the way we kind of first started pulling together ideas, on who our client could possibly be. I think we even kind of you <b>can share documents through Facebook.</b> So we
I	Ah right
Team	Occasionally we even do that, um / Timetables as well / Yeah, we put together timetables / [name] at the beginning of every term [name] puts together a timetable so we can see where our gaps are and therefore where we can meet, and things like that, yeah. I don't think we really use any other social media, do we? / Nah, it's just Facebook
I	Did you know each other before you started your consultancy project ?
Team	yeah
I	Had you all worked together?
Team	Yes, us three all worked for the SBE in the second year
I	Mm
Team	And [name] the fourth member worked, um, with us in the first year on a couple of tasks so we all knew each other and got together. / We've all always been in the same seminar group because we're last in the alphabet
I	Oh right [laughs]
Team	Yeah, we decided, we kinda did it the backwards way, we decided as a group and then we got a client on board.
I	Ah, sure
Team	And then, yes, <b>we kind of just kept in contact through the Facebook group.</b> / To be honest, it was actually, especially at the beginning, it was essential because as [name] said, once we'd all decided we wanted to do a consultancy project and that we wanted to work together as a group, none of us lived particularly close to each other so during that period we were kind of finishing off our placement year and we hadn't quite got back to Bournemouth yet, and we knew that we still needed a client, it was the main way we could discuss that as a group, <b>as opposed to, so if you're texting each other it's only one person, whereas in a group you can actually collaborate and kind of give feedback and things like that so it was really really useful.</b> / I think that's the main thing that we used like Facebook for, like over, like either texting or something, because like <b>often like an issue might arise in the project, or, something that needs an idea or something, so we'd just put it out there and the group someone will just post a message and say we've got this problem we've got this opportunity what does everyone think and then everyone can, in their own time, just say y'know ah we can do this, we can open conversation whereas if you're on a phone call or a text or something, it's just not really as, as effective / yeah /</b> And obviously we're all kind of <b>connected to Facebook like 24/7 with our phones and everyone's on the Internet, so it's really just like, gives us the opportunity to, kind of constantly be connected like. There's not a day that goes by that there's not a post on the Facebook group /</b> no exactly / or like / at least one today / it's as [name] said like, an example probably would be at the moment [name] he's kind of in charge of the wiki and he, today, is basically going to write a list of everything that he thinks is left to do on the wiki, the kind of touching up of it, and then <b>we're going to feedback if we can kind of think of anything else.</b> So <b>it's a great place, rather than him send the</b>

	list to each of us, then us each send separate lists back, he can just write a post on Facebook saying these are the few things I think I've got left and we can just comment on it, say if there's anything / but if there's a big list there it won't go in the safe group because we have a DropBox, all like joined by us, so we'll just say oh we've put it in the DropBox, see it there and comment on the Facebook group what we think
I	And that's a DropBox on, is that a Facebook facility? I'm not on Facebook
Team	No, it's not linked to Facebook the DropBox / it's very similar to like the Sky drive, um
I [5:08]	Oh right, I'm with you
Team	It's a very similar idea to that. Um, so yeah, any, as [name] said, any kind of big document at all or any long lists we'll put on DropBox, um, cos DropBox is really good, you can basically just go in and edit things very easily and re-upload it and things like that so if had like a working draft you can have it on DropBox. It just saves us, it just saves us kind of cluttering up the wiki while we're working, cos obviously we upload to the wiki as we go along but it, it saves us putting so much stuff on there that we get confused, it's better to kind of / it's basically ok for managing documents in terms of, you can upload documents and photos and different stuff but it's not the best so therefore we use Facebook just to kind of inform the group that's something would be in DropBox
I [6:02]	Ah right
Team	You can't have like folders and stuff on Facebook / no, you can't have folders but you can upload files / you can't upload very big files on Facebook / not too many / it's not very much / we have like loads of separate files and folders and stuff in DropBox / yeah
I [6:18]	So how do you view the wiki, is that simply the final deliverable that you're doing for the university? You haven't used it to help collaborate at all?
Team	Um, it's, I mean, I think for some things, things like updating our time logs are, as we've gone through, although we have changed that more recently just cos it's easier, but mainly we've kind of updated it on that, obviously things like risk assessment is just an automatic update to the wiki, communications log / change management as well / but we don't use it for direct communication because there's no way to notify like, to notify if somebody's posted, we'd all have to check it with emails, whereas Facebook is instant to your phone / I would say it would probably be like periodic like in terms of after maybe a certain deliverable has been completed, we've kind of uploaded that deliverable onto the wiki and we've kind of rejigged it, obviously the milestone came up, so we got it up to a good point and then we've y'know gone back and improved it again, so that's probably I would say, as much as we
I [7:30]	But if you didn't have to do it for us for the end, would you be using the wiki at all? Does it serve any purpose, I mean you've got DropBox and you've got
Team	Dunno / No / DropBox is really good I really love DropBox / DropBox is really really good
I [7:41]	Can more than one, do you have to download and edit it and then put it back or can you work on it, can two of you work on it at once?
Team	You can access it in two different ways. You can access it from anywhere by logging online and then everything that you've got in there comes up
I [7:57]	Is that to edit or just or view it
Team	On no, edit as well. It's literally just like an online USB pretty much
I [8:07]	Oh right
Team	That everybody like joins. I've made it like [?] everybody can view everything that's in our folder. And you can also download it to your laptop and then it becomes a folder in your documents on your laptop, and then you don't have to go online to access it at all, everything instantly downloads every time you connect the Internet, any updates. It's really good.
I [8:28]	And that happens automatically?
Team	That's the good thing about it, it kind of synchronizes everytime you turn on your laptop and therefore you don't even need Internet because as long as you've had Internet for a period and it's downloaded everything, then you can just go on and use it and it'll upload it the next time you have Internet it

	<p>will make it available to everybody else. / So when we're like travelling, when we go to London to see the client we always have everything / yeah / so you've got DropBox and it's always downloaded and then you can access every file you've discussed with them before, or you want to bring up a previous file, or, um, anything like that, we obviously manage different files so it's a really good way to kind of / obviously without the wiki for the final deliverable there wouldn't be like the narrative and the explanation of why we've done these things because it's just a document / yeah / oh I think in terms of, there would be no way, if we'd had any [?] deliverable we had to present to you in terms of a visual thing you could look through, you'd never do that on a DropBox / the wiki allows you to bring it all together / exactly / into an actual sort of project rather than just a series of files / there's no real kind of front end interface on a DropBox, it's literally just a place to kind of dump your files, and obviously you can sort them out in to folders and things like that, so there'd be no way to kind of actually communicate our message to somebody through DropBox that's what I guess / I suppose we treat the wiki more like a web site don't we / yeah / it's kind of what would our web site be if we were a real consultancy company</p>
I [10:17]	<p>So when, do you get a message from DropBox when somebody else has uploaded a new version of something?</p>
Team	<p>Only if you're on your computer / you won't get through like on, as an email or anything / you might get a notification on your phone / you can get it up that way / you can set it up that way / that's a key thing to be honest as well actually, just touching on phones, I think most of us access, well I definitely do access a lot of what we do on Facebook and on DropBox on our phones, maybe not so much DropBox but Facebook definitely I think / yeah / probably fifty percent of the time that I'm communicating on Facebook it's kind of on the go and I'm just doing it on my phone, it's just so easy it just pops up</p>
I [11:02]	<p>Is that the same for all of you?</p>
Team	<p>Yeah, and I organize a lot of the news with [stakeholder name] cos I'm like head of comms and I constantly email [stakeholder name] from my phone as well, unfortunately for her / maybe I don't use it as much as [name] but I do communicate a lot with my phone as well um, I don't have the DropBox notification or anything as well / [?]</p>
I [11:28]	<p>And what about [name] as he got an iphone as well?</p>
Team	<p>He definitely accesses Facebook a lot through his phone and I think he's got the DropBox App on there probably but definitely yeah he uses it a lot</p>
I [11:46]	<p>Do you think your use has changed as the project has progressed? Did you all know about all these facilities to start with or did somebody know about them and has had to tell the others about them, or how to use it, or anything like that?</p>
Team	<p>Originally we had a bit of a battle [name] originally set up a Skydrive but I was getting frustrated with it cos I had a few problems, it wasn't working very well so I was like we're not using it anymore and did the DropBox instead / I believe, I believe DropBox is much better / yeah / so we use</p>
I [12:18]	<p>But what were the limitations of the Skydrive, what were the problems you were encountering?</p>
Team	<p>Skydrive's much more temperamental, it's just not as solid software</p>
I	<p>Oh really, technical issues</p>
Team	<p>That's what we found anyway. We just had, especially on the university's computers, kind of opening and saving files, it just sometimes wasn't working. Em, and also there's the added fact with DropBox that if you've downloaded it to your desktop on your laptop it's just as simple as saving a document to my documents with Skydrive you've always got to upload or download. Whereas with DropBox if you've got the actual thing downloaded, it's just really simple / it's just a better product really wasn't it / I always knew about DropBox though like but I never really used it until we did this project whereas now I use it for everything, all my units now / I just save everything on it so you've just got this kind of seamless link if you want to do some work at home and you want to do it on the university computer that's fine but I just save everything to DropBox when I'm working on my home laptop</p>



<p>I [13:38]</p> <p>Team</p>	<p>Ah right, so you don't log directly onto your H drive from, remotely, you just No, I just do it from DropBox, I can just, it's just easy enough to do / I don't think I've ever used the H drive from home / my housemates do though to be fair, they access the H drive from home, it'll just depend on the course you're on. / <i>And the other thing about it is you're worried about loosing work and if it's stored in an online space there's no worry about it disappearing so if it's on DropBox you're pretty much safe, no matter what happens you can get your work back if your laptop crashes or something like that</i></p>
<p>I [14:23]</p>	<p>Right. And how have you, how have you handled, the actual collaboration during the project? So, do you get together and agree who is going to do what, how do you sort of, I suppose there are different stages aren't there, so there's decision making, and then actually getting on with the work, how does that work in practice and how do you communicate, is it mostly face to face, or, how does that work?</p>
<p>Team</p>	<p>I think actually probably one of the strengths of our group is that we do meet very regularly face to face. We have two set meetings every week / two set meetings every week / which is meant to be, well, well a minimum of one hour but it's usually two, sometimes it can last a day if we've got a lot of work to do. And previously we used to split it kind of one focus on client deliverables and one on project management but now we're much more client deliverable based now as we did a lot of the project management at the beginning of the project so we're kind of on top of that so it's now more kind of client deliverable stuff um at the moment. And then I think in terms of kind of delegating responsibility I think [name] has got a really good kind of forecast of hours which also kind of breaks down the tasks as well so we work from that um and then kind of delegate accordingly. I mean at the beginning I was kind of assigned the role as project manager which I guess in this project isn't necessarily, doesn't necessarily mean I manage every aspect of it because we obviously all manage as a group because there's only four of us but in terms of delegation it's kind of where it would come into play. We would obviously discuss it but everyone's kind of responsible for different things. / I think delegation like in this task has been really easy because, because we've all known each other throughout our university kind of lives and we've worked together quite a lot we each know exactly where everyone fits in the project, exactly what tasks everyone would be best doing. There hasn't ever been a situation where we've been like in discrepancy about who should take on what task. We each know our strengths so like delegation hasn't ever been an issue in our project. / I think it's actually quite interesting, in one of our other modules, this reminds me of this because I interview the CEO from my company last year, and he said something along the lines of you know when you've got a good management team underneath you when you don't need to delegate because people know what they're doing, and I think that's kind of basically what's happened with us this year just because we've worked together so many times. [?] boring stuff, [name] does the creative stuff [?]. We've kind of gone through it and everyone knows what their strengths are. / There's also a saying busy people never say no / yeah / [?] / you never say no to me and I say yeah I know [laughter].</p>
<p>I [17:44]</p>	<p>So in terms of, you meet twice a week and that's a scheduled time for you, so you did your timetables so that's a regular slot for you, so you haven't got to arrange meetings.</p>
<p>Team</p>	<p>I think that was the point at the beginning, we didn't want to have that situation of oh when can everyone meet. So that like everyone's busy this year but the slot was ten to twelve on a Tuesday, and then it was er, one to two on a Friday. So we kind of split them up so that you have enough time to do some work during that time so that often we would each go away and do some work and we would present it during that meeting, like our findings. / And then everyone knows how many hours they should be working individually that week because [name] has already forecasted it, so you already know what you need to be doing that week in order to make sure you're balancing out what you're doing each week, otherwise everyone will have worked four hundred hours or so. / I think that's what been especially</p>

	<p>good towards the back end of the project as we've really got on top of the forecast hours which [name] has put together, and kind of worked out that essentially if we do x amount of hours every week then we're going to be staying on track. So to be honest a lot of it usually gets done so if we meet on Tuesday and do some work and meet on Friday and do some work I think we'll do the filling in between the Tuesday and the Friday and over the week end and the Monday and then we usually leave the Wednesday and Thursday will for other modules and things like that and other times as well / yeah that something we've definitely learnt during the project [?] at the beginning we didn't necessarily manage the project in terms of hours and then we kind of, after a couple of months we realized well actually we need to know exactly how many hours we'll do each week and exactly what tasks need what hours allocated to them in order to make sure we kind of hit this four hundred hour and not go drastically over or drastically under and then obviously we adjusted the scope of the project to kind of meet the, the</p>
I [20:12]	<p>So does that mean that at some point your, you did more detailed planning, you had an initial plan and then?</p>
Team	<p>Yeah, yeah we er</p>
I [20:21]	<p>And then you did adjusted your timing around that, can you remember?</p>
Team	<p>Yeah it was around December / December third we changed everything / [?] December third was when we introduced the er that was the breakdown of the project management and client deliverables / and we did the Gantt chart again as well then / and even since then we've been breaking down per week, so I think again I think it was maybe the end of January we broke down exactly per week what everyone was going to do, and knew when we kind of saw the end of the tunnel and we knew per week what everyone needs to do, so / it was difficult for us at the beginning though because although we had an idea of what we were doing with the client, until we actually got stuck in, and actually planned all the deliverables, and kind of saw how the project like unfolded, it was kind of difficult to know where we were going to head ultimately and the scope did change a little bit as well and we did much more research / scope creep [?] there's been a lot of that / and I suppose as well we always [?] a big part of our project has been um market research and, but we've never known the budget allocation [co name] have had for us in terms of like, how much we can actually do, we wanted to do focus groups and there was always a potential for them to be able to fund some really good focus groups for us to do. Em, but like when it came down to it they didn't actually have the budget for it so we've had to manage, do our own focus groups so obviously it's been less representative and so we've always had to kind of manage that kind of issue. It could take a couple of hours to do a focus group ourselves or [co name] could want us to do a whole range of focus groups if they have the budget.so [?] / it's something they can go on to do/ they can certainly come back to do after our project if they take if on further our recommendations to [?] / Kind of, going back to the project management stuff we were touching on, I think none of us had done project management before this year, I think it actually links back quite nicely to Facebook and shows how we've learnt, cos I think we almost <b>managed our project in the beginning entirely through Facebook</b>, and did it through a very kind of er, and tried to manage it in a very kind of practical and basic way, in term of you do this, we'll do this and the project management tools were just things we kind of did together for the PID. But what I think what we've really learnt as we've gone through is how useful they are, especially things like the forecasted hours which has probably been the key one that has most useful.</p>
I [23:25]	<p>Ah right</p>
Team	<p>Um, I think we've really learnt how they apply to our project and actually make the whole thing run so much more efficiently. I think / rather than just something we have to do / exactly / and I think that's probably where you actually look at social media and there is a downfall there because, it is very unofficial. I mean when we come to logging all our Facebook posts in our communications log, like, you look through it and think, ah like, some of the stuff's like, you can't put up there because it needs to be changed and</p>

	everything, it's like you look at it and think well actually it's not particularly formal and a lot of stuff goes kind of unregistered and unrecorded and things like that which is probably one of the downfalls of it
I [24:16]	Yeah, but was the informality a help or a hindrance?
Team	It's a help in terms of, <b>in collaborating and in the form of discussion</b> , it's definitely a help in terms of that, just the way that it can hinder you is the way it's just a bit more kind of um spread out and less concise whereas / and maybe I suppose overload as well and like / yeah overload rather than just having here are our set tasks and here's how long they should take, here's how long we've got budgeted for them, on Facebook it'll just kind of be like can you get this done over the week end, <b>can you get this done over the rest of the week / because there's that constant communication</b> , if something pops up, outside of a meeting, that we kind of feel like we need to get done straight away, you might not, you might, cos it's quite informal we'll feel like oh we'll just put that task up there and see who's got time to kind of do that before the next meeting. So, y'know that kind of maybe undermines some of the stuff you delegate in the meeting. Um, <b>it hasn't ever caused a problem</b> but it just, um, I suppose, that's where maybe if you were running this as a consultancy firm then maybe this wouldn't work, in the real er / and <b>the other thing is when people put things up late, when I've gone to bed, and for the next morning</b> . It's like they change the time of the next meeting and then I don't see it because I've already gone to bed [laughter] then I wake up and I'm like oh I'm meant to be in uni in a quarter of an hour.
I [25:59]	So this is all very, in a sense, I suppose it sounds to me as though like the social media has introduced a sense of immediacy and um [?] for me it's like with the iPad you're at work 24/7.
Team	Yeah. People are posting queries at like one in the morning like on things that just pop into your head and / literally it just comes into your head and you whack it onto the group and yeah but
I [26:27]	Again, has that got positives and minuses?
Team	Yeah, it has, because some of these things can wait. It's not so immediate but once it's thrown out there it's it's too late, everyone's thinking about it [?] there's no break, it means that there is never a holiday because people are always posting something on it. / I think the way you can look at things like that, in terms of our project it's probably a positive because it does mean that we have this constant communication and we constantly improve and get things done. But maybe in terms of our emotional welfare it's not that good [laughter] / it's the same thing with mobile phones though, because now if you have something to say you ring somebody but before you had to write a letter and wait a week. Now, everything's just a, everything's an emergency. / yeah
I [27:22]	Have you done anything about that issue? Have you recognized there's no break, have you handled it at all
Team	No / [?] we comment on it / No, we have, for our most recent strategy management assignment was in um a week ago now, we had um a week where we said right no communication. We worked, we'd had our final meeting with our client before, we've got two presentations coming up, we had our final meeting with our client the day before, the week before, our hand-in and we just said look we'd worked really hard on it for the last few weeks so let's just have a week off so we can concentrate on our assignment. And to be fair like, I was shocked, there were no posts for like pretty much a week [?] we started talking about other work and stuff [?] that did work, that did work quite well
I [28:20]	So you made a positive decision to have a break and you adhered to that
Team	That decision had been made quite a long time ago as well. It was something that was forecast that and we realized if we had a meeting then could probably afford to take a week off to concentrate on strategic management and then we would also know that leading up to that week we would also know we wouldn't have too much worry about strategic management. We would have an entire week just dedicated to that / yeah / I think that was something we planned in quite early that definitely worked, we were able to take a break and come back to it and realise ok we've still got

	stuff to do but we've got enough time to do it. It's not as if we kind of put it off and there's not going to be enough time to do it.
I [29:12]	Was getting back into the rhythm afterwards a problem, or were you just straight back in there as though you'd never stopped?
Team	<p>We handed it in on the Wednesday and we met again on the Thursday / yeah so [?] / and then we, we had like a meeting on the Thursday just to get everyone back in the swing of things. And then it's just this week that we've come back into uni and we're starting to really pick up again the, the kind of the final deliverables that, we've got to, we've got a presentation next Friday so, we just collaborated on that at the moment kind of / yeah / it maybe does kind of take a bit of time to maybe get back into the swing of things when you've had a week off / especially where you've had a complete week focused on something completely different / a different assignment, your brain does kind of turn a bit and then you have to come back. But it doesn't take long. I think if we kind of just sit down for about an hour to discuss where we are. Luckily [name]'s quite good at taking notes so we can always quite quickly just pick up from where we left off / strat man was quite a good unit and if we'd had that in the first term it would have perhaps helped our project a bit more. Some of the things we've done for [co name] do relate back to what we had to do strategy [?] If we'd had that unit before we could of done things like a value chain and other things at the beginning to like inform [?] / I think we've had that a lot throughout, especially with the modules you've done. I think you've done [name] has really taken a lot from two marketing modules he's done, because we're doing a marketing based consultancy project, um, and there's been a lot. I mean our final deliverables are essentially, the template for it is based around something that [name] got from, yeah / I suppose with marketing in previous years, it hasn't been as focused on um what I would call our core marketing. Like in our second year we had um consumer behaviour and market research that were separate and specific um functions of marketing. But then this year it's been um like the specialists term strategic marketing which is exactly what we're kind of doing in our project, so every lecture has just been about learning exactly how to manage the aspects of our marketing plan which is our final deliverable / So just bringing that back round to social media, it makes it so much easier for [name] to come straight out of the lecture or a seminar on strategic marketing and when it's fresh in his mind and say actually I've learnt this and this applies to consultancy project, so what I've been doing focusing on consultancy today, I can take things from what I've just learnt and apply it to the project we've got. / I think as well I quite often like will share videos and stuff like off the back of this obviously like quite a large element of our project is a creative element, we've got to kind of create like this brand y'know every time we kind of see something in the online or something like a viral ad that we think is quite relevant, we just post it on there / I do a lot of that / [?] yeah I do a lot of that [laughter] / especially when we've got to, when we have to do a brainstorming session, um like the next day or something, get everyone in the kind of [?] step out of your project management mind and into kind of [?] / it is also a bit like when you sort of log in or you get anything on your phone and you see somebody's posted in the consultancy forum and you think um what is it now like, most of the time it's like perfectly fine, but sometimes you just get that one comment and you think you didn't want to read that today, you could have read it later. / What was that for? / It's just some of them, like I can't think of one in particular, like the one when y'know when I woke up and had to be in uni for like the next hour [?] / what you realized there was a forum on? / yeah and that, like sometimes when you just forget about things and people just post things that are actually urgent you forgot about, and sometime I get a horrible feeling in my gut when I see that there's loads of posts, say there's like five posts and I've not read any of them and I think a bit busy something must have happened.</p>
I [33:57]	Is that posts within Facebook?
Team	Yeah
I	Are you notified separately about each one?

Team	Well, on the left hand side it has like all the groups that you're part of and the top one's like consultancy group and then when people post a little number comes up next to it to say how many posts there are. If it says there's been five or six since I've last checked it I think something like big must have happened because everyone's posting and like what have I missed and then I get a funny feeling in my gut and [?]
I [34:36]	Are there any patterns to what you've been posting on Facebook or how frequently and that sort of thing or
Team	Every time we have a meeting and [?] booked a booth I'll post on it saying which booth we are and where we're meeting, what time / there's a lot of kind of organising logistics of where and when we're gonna meeting and if someone's unavailable for whatever reason, there's a lot of that. In terms of like [?] patterns, inevitably when we go away for holiday things do, I wouldn't go as far as to say [?] but they do die down a little bit. Obviously it's good that we've got it there because we can still communicate but to be honest it generally coincides with budgeted time that we've given ourselves off, which is kind of understandable anyway. So I think when we're, when we don't have kind of budgeted consultancy time to be working I think we all need to take a break so it's usually [?] / I would probably say that it's kind of our Facebook activity correlates with our, how often we meet actually. / Which is quite strange [?] / we don't really use Facebook as a way of replacing the fact that we're not meeting for a week or something, because we're on holiday, or we're working on something else, um we use it as a way to complement the meetings we have and kind of fill in the gaps and /
I [36:15]	Oh interesting
Team	So / We pick the main points up from the meeting don't we / immediately after a meeting we kind of summarize exactly what we went through and um someone might have a specific question, cos obviously like after a meeting we go often away and do our individual sections ourselves separately so we're not constantly like badgering each other every minute. So like if um well [?] [laughter] but um yeah, then you can ask questions and someone can kind of respond in their own time. Yeah, it kind of complements the meetings really.
I [36:56]	So are you sort of posting when you've completed something, saying I've finished this now, so have you done your bit sort of thing
Team	Yeah
I	What happens?
Team	There's a lot about, the most common time by far, you'll see at least ten posts a day is when we've got something, a deliverable coming up or a milestone or something like that. I mean obviously if people are doing work it's like can you proof read this or can you do this bit, can you send me work bit over, that's when it is. I think it's actually quite interesting what [name] said there, it's strange how we don't in any way use Facebook, Facebook to keep in touch, I don't think, I wouldn't say that, I mean it's not as a replacement for when we're not meeting, it's, it's to just kind of to keep an ongoing discussion when we're in the midst of a heavy period of consultancy that we're working really hard on and we've got a deliverable coming up and we're most active. / It's kind of the any like the exciting or anyway relevant thing that happens on my Facebook anymore now as well [laughter] Facebook's so boring now that the only thing that ever really happens now is with the consultancy group [?] I probably wouldn't be on it / I wouldn't go on it half as much if it wasn't [?] / I log on to check what's happening on there, and then browsing on other things but it's probably the only thing that pulls me to it now, it's kind of phased out for me a bit, I kind of need a new thing. / But the, but for what it does there's nothing better though, like y'know it's not there's other things out there that can do what Facebook do s [?] / I think the strength of Facebook by far is that everybody's on it, I think. There are places like, I work in social media last year
I [38:57]	Ah right
Team	So I know a fair bit about it. And there are some really good social networks out there, I'll give you a great example is Google, they've got a thing called a Google Hangout, which to be honest in terms of collaborating you can't

	really get better because it's so free flowing in the way you can present information and discuss with people. But because Google plus as a concept hasn't taken off, therefore nobody has it, therefore it makes it pointless. Facebook's the
I [39:26]	Is it free? Could you have used it for your project? So why did you choose?
	If we'd want to. But because, to be honest there's not too much difference in terms of how we would want to communicate, I think. Google plus is a slightly nicer interface and you can kind of get discussions going a bit better in the way it's laid out, but it's nothing major in getting everybody to set up a Google account and. On Facebook it's as easy as clicking some buttons and you've got a group and you know that all your friends are on Facebook and you can invite them, all you do you can set up a group in a minute, it's really easy to do. / Is that likely to be like if we went onto this Google plus obviously then that would then be another thing you would have to set up with all of your devices and you wouldn't actually feel as conn, I think you wouldn't feel as connected as we do with Facebook, because / yeah / maybe we go on Facebook a lot because of our group stuff but also you are on Facebook a little bit of the time anyway so it doesn't seem much effort./ I can't quite believe how much this thing rules my life / yeah
I [40:32]	Thing as in Facebook or the project?
Team	Facebook
I	[laughter]
Team	[?] So funny again [?] laughter / it's something we've always, it's not like just this year, like in the xp project we used it as well so / I've still got that group / yeah I've still got that group as well and um / we used it for entrepreneurship as well in the first term of this year. Again it was our, pretty much our primary tool for communicating for that. There was nine of us in that and there's only four of us in this project as well. / It happens in a lot of other units as well, like when we were doing strategy in that week I must have had about five different conversations going on in Facebook about strategy and talking to people about strategy and different things they've done. So it is useful for like connecting like everybody in uni and talking about things. / My um marketing lecturer also set up a Facebook group for our for our lecture cohort as well. So like for marketing they're constantly like posting like details about the lecture, lecture slides and seminar presentations
I [41:52]	On Facebook?
Team	Yeah, on Facebook yeah
I	And how do you find that like compared to myBU?
Team	Much better [?] cos like
I	Because you're there anyway. [?] I'm going to have to get on Facebook
Team	[?] No, it's only one lecturer to be fair. It works really well for marketing cos erm you can constantly share ideas and again constantly sharing videos and like new products out, that's relevant for the subject area we're learning so./ I just want to say that myBU is good now because it texts you, like with updates to your lectures and things when they're cancelled, so that's definitely a big improvement. / yeah / I think the only thing that can be comparable on myBU to what Facebook provides, the closest thing is probably the discussion boards. But in terms of the interface now, they're still [?]nowhere near Facebook really, because [?] Facebook is really, if you click on a button to go on a group you can then, within 30 seconds scroll down the entire thing and see all previous conversations, what people have commented on, conversations, where people have been sharing. Whereas on myBU, obviously announcements are a one way thing that we just get and can't kind of interact and engage and ask questions on. Em, and then the discussion board obviously it's basically a forum so it's more about kind of just clicking on different topics and replying to specific topics and then if you want to go to a different you have to come out and go into the next one. / You know you can see them all on one page / ah, I didn't know that [laughter] / I'll show you later. / The last assignment strategic management I think the discussion board just got out of hand / my god yeah / [?] yeah, that'd be quite interesting if, for example if [name] the guy which ran the module, he set up the Facebook group for strategic management, because

	there were so many late issues with the assignment, that might not have been necessarily be a good thing / not for him / it would have been crazy / that just shows you've got to be really careful because the discussion forum went mental because there were so many people just saying I don't understand this. / Anything when you've got four hundred students doing this, one unit, you can't manage a collaborative posting system in Facebook or a discussion / he was like pulling his hair out / I feel so sorry for him / he must just / you could just see from the times of his posts [?] but that was kind of his own doing cos he should just have said [?] he shouldn't have answered the ones that just repeated what had already been asked / yeah/ he wasn't strict enough with like people, he was too nice / the assignment brief could have been more explicit as well [?]
I [45:26]	Has any of that happened in your consultancy project, in your use of Facebook yourselves? or is your group sufficiently small and do you know each other well enough for that not arise?
Team	Size really. / I think / It worked for SBE and that was eleven. <b>So now maybe if, maybe twenty plus I suppose might get kind of a bit / you might struggle /</b> that's be the point where'd [?] / but then my seminar group's, I think, fourteen and that never gets [?] / but that's more informative rather than discussion [?] / I think entrepreneurship which was nine and that was no more difficult to manage than, than this. I was project manager for that as well so it wasn't, it was kind of similar, similar sort of experience. I think you'd need to get quite high numbers before it would get, I think the issues arise when there's you get one person that's answering to a lot of people and then it's just, can't kind of, I think it's probably just about being careful how you use it, and what you choose to respond to.
I [46:50]	I'm just trying to get a handle on, if you hadn't, if you weren't communicating through Facebook for your consultancy project, how would that, or how is communicating through Facebook affecting the project in terms of, um engagement, in terms of how, um, how much you share information and how much um you feel emotionally attached to the project or motivated on the project, does any of that resonate?
Team	I think to be honest, in terms of kind of the things you mention there, <b>I can't think of any ways it's affecting it negatively, cos it definitely keeps us much more engaged with the project, definitely keeps us much more kind of on the ball with the project, and it definitely keep us</b>
I [47:46]	How does on the ball happen? What keep you more on the ball?
Team	<b>I guess it's the immediacy thing. If someone has a query, they can post it to Facebook, they can tag somebody directly in it. If there's something they want to post to directly and then people can reply very quickly.</b>
I [48:05]	Ah right
Team	There's no privacy either. Because now Facebook has this new function where um when you post something, it <b>has this thing called seen and it shows you how many people in that group have seen the post.</b>
I	Oh right
Team	Eventually it'll come up seen and then by all. So if everybody, if the person that posted knows that everybody's seen it, and not replied, <b>there's kind of no excuse as to why you've not replied, because you've read it and you've been on Facebook. / A degree of accountability as well like, you can't say oh no I didn't see that [?]</b> / so, so for example, so if [name] was to ask me to do something and I was to go oh I don't want to do that and click off again, she knows I've seen it so I'd be in trouble [laughter].
I [48:54]	Ah right. I wondered when you said privacy if that was going to be a downside, in term of um.
Team	[?] if you've been out the night before and got pictures of you in Lava, and you've not done it, well, we know why [laughter] don't we [name] [laughter]. / Again I don't think it's a negative for the project, but it's negative for your own kind of personal lives I suppose isn't it. / I think that's like, it's kind of a different subject but, I think generally speaking, privacy is almost a thing of the past if you're on Facebook, unless you're really careful and have your settings set to. Facebook [?] they can take whatever they like from you and

	all your friends can see whatever they like from you so its. But in terms of within the group, I mean there's no particular need to
I [49:54]	So is what you share about the project private to the four of you?
Team	Yeah
I	Ah right
Team	So we've got the group set to [?] You can change the settings so you can have the group so it's either open so anybody can join and look at what you're doing. You can have it so it's invite only which means people can see the group and they have to be invited to join, or you can have what ours is, which is like just closed, it's just a secret group, so we're the only four
I [50:26]	So even though other people outside your four are your friends, they can't see
Team	No, no I don't think they know, I don't think they even know it exists. / [?] It's completely hidden to everyone on Facebook.
I	But, does that , flipping that on its head because you four are connected in the that group, does that mean you can see everything else about each other, in terms of the other Facebook activities?
Team	Yeah, <a href="#">we're all friends anyway</a> . / That kind of comes, rather than the group thing, it comes whether you're friends [?]
I	So could you be in a group and not be friends?
Team	No
I	Does Facebook not allow that?
Team	No [?] yeah, you could in a roundabout way, you could have people in your group you didn't want as friends [?] / I think that would be a little be weird [?]
I [51:32]	If [name] joined like that, could she then see everything about you?
Team	Only if then she added me on Facebook. [?] so we could not have any personal interaction on Facebook, only if there was a third person in the group that was willing to be open to everybody / it does depend on your own privacy settings. Because if you are public, then everybody can see everything anyway, even if they're not your friend. Obviously if you have it set to only my friends can see what I post.
I	And what do you opt to do?
Team	I'm just private as it can get. / Yeah, mine's private as well [?]
I [52:20]	So only your friends can see?
Team	I think the most private you can get it is so that, people from the outside can literally see one picture of you, which is your main picture, and to be honest nobody has anything too bad as their main because it's meant to kind of reflect who you are. / You can get even more private than, you can get it so your friends can't even post on your wall [?] / I had a friend in the sixth form who was really like anti Facebook, like hated it, and they only used it for [?] and you had to like ask permission to post on his wall. Like you'd post something and he'd have to accept it [?] <a href="#">We've all been really good friends anyway from the beginning</a> so
I [53:10]	I suppose in a work setting, and obviously this is why you've got things like LinkedIn isn't it, it would be difficult to use Facebook, from the sound of it, to actually completely separate your work personality from [?] and your friendship circle. [?] So that's interesting.
Team	Once you get into the workplace like, I think that would be difficult. Because especially if you had like, you didn't want to have your boss on Facebook but then if you had them in a group, yeah, and like if you're going out at the weekend and y'know pictures, you can't control the pictures, well you can't really control pictures that are uploaded, well, you can, but / it would be difficult [?] / And a lot of people don't like having like work colleagues and stuff as friends on Facebook / When I first started in my job last year, my boss was quite young and he's a quite a good friend and he basically said very early on, if you want to go far, don't add anybody from work you don't completely trust, and also just set everything to private. That's probably way over the top but you hear so many horror stories about people getting the sacked because [?] That's the problem with it I think. [?] Although there isn't much privacy generally if you have someone as a friend, if you're careful about it and you keep stuff private, you can make it so that at least only people you want to can see what you're doing, I think that's the important



	thing. / The other thing though I think is if you don't want people to know, don't create a Facebook account [?] / You say that though, but that's kind of [?] think how much you'd miss out on it. You couldn't be part of these groups, people invite you to their wedding over Facebook now. You'd miss out on a lot if you weren't on Facebook now / Maybe like as kind of Facebook evolves maybe they'll get to a point where you'll be able to like really down, down scale your like usage on Facebook so it's just like keep in contact with some old friends / You can have that, you can put your friends into different categories, you can make different friends lists, and then each of those lists can have different privacy settings
I [56: 37]	Ah right
Team	There is so much functionality with Facebook that you wouldn't even really bother doing unless you were, really like. I think if you really wanted to you could down grade even now down to quite a real basic Facebook / but I don't know, can you do like groups and stuff with LinkedIn, I'm not that, I can
I [57:04]	Oh yes, yes. I mean we've got one team using Podio and they were saying there were some enhancements to that to make it much more Facebook like in terms of the interface
Team	I've never used Podio but I know my girlfriend used it for, in her work setting. Because they worked, she worked for a small startup company
I [57:20]	Ah right
Team	And there was probably only fifteen employees something like that and they used it constantly, and that was within a work environment. But to be fair, it might not be the best case study because they're very very informal environment, there is barely any kind of professionalism, they're all really young and it was all very informal. But maybe, as I said I've not used it myself, but that might be [?] at work, I'm not sure.
I [57:50]	That I gather is specifically geared to project management. I've got one group using that. So do you still use your phones to communicate with each other, or is just everything on Facebook?
Team	Nah, I just tried to ban [name] from calling me too much [laughter] at one point it was nearly an hour every day [?] but no, <a href="#">we do speak a lot via text and phone as well when it's something that needs more explanation than just a quick post on Facebook we need to talk about it.</a> Because we do like pair off for quite a few tasks, generally like, when it's just two people working on one thing, then phone communication is fine and we just
I [58:37]	Is that just because you haven't just gone for conference calls or Skype or anything like that, it's just two-way communication on the phone [?]
Team	I think at the beginning when we were all in separate parts still finishing our placement we did consider doing it. But luckily it kind everything did just sort itself out without us having the need to get on the phone together. What we have done in the past is, [?] in the past when I've been at home for whatever reason, if I've had to go back home for the weekend [?] they've had me on speaker phone if that's necessary [?]
I [59:19]	So you've used that to bridge the distance as well [?]
Team	Because we meet twice a week anyway there's not really / even when we've gone home, like we've not really gone home for that long two weeks Christmas would have been probably two weeks and we had planned to have two weeks off in our project anyway [?] there's not been [?]
I	Yes, you've said you saw Facebook as complementing your meetings so did that mean there was very little use of Facebook when you weren't meeting as well, is that what you are saying?
Team	Yes, definitely. I would say average posts over Christmas probably would have been like once every three or four days / as opposed to three or four a day
I [1:00:20]	So it almost does mirror the face to face rather than being a good substitute when you can't meet physically so that's not
Team	[?] I think actually [name] was the only one who posted actually saying he was sending round some stuff by email for comment [?].
I [1:00:35]	And what role has email had? Is that still being
Team	Email between us and the client is the main form of communication
I	Ah right

Team	And [name of supervisor] / and between us when we're organizing things like between the three of us and it'll be like we, too expensive [?] so we'll email back and forth our train tickets and coach bookings and stuff. / Actually, if you think about it, especially since we started using DropBox, in terms of internal communications [?] we barely barely use email at all, it's mainly just the client
I [1:01:15]	And does the client use DropBox or Facebook or anything?
Team	No. We just communicate email or face to face / that's pretty much it
I	And is that their preference? Or your preference? Or limited by the technology or
Team	<p>Er, email was just a thing that was just introduced in the first meeting. Emails were just exchanged and we were asked to email our contact with these initially and liaise with her. And then our main contact [name] we cc'd into all the emails with [name] / Our actual sponsor is quite high up so we actually go through his like um secretary for all of the meetings we've had. We don't actually have that much contact with him via email anyway, it's only ever if anything, we meet with him every I think like every month with him and then every kind of two weeks we meet with some of his um subordinates / That's actually a general point I think, with this project we've had a lot of freedom, which we kind of knew we'd have from the start. I think towards the first half of the client deliverables it was very research based and we met quite regularly with a, with a lady from [co name] who was in the market research department. Um, but since that's all kind of gone, I think meetings with [co name], with [name] whose our actual project sponsor that's what I said is quite high up, have been once every three weeks something like that, maybe not even quite that. And it would be more a case of going to the meeting, having an hour where we'll outline what we've done, he'll give us some really good insight into how he thinks we're doing and where he thinks we should take it, and then basically it's a case of us going off and creating kind of what we think's appropriate. / Yeah/ I think that's where probably we're the marketing consultants project really does give us a lot of license because we're, he really wants us to use our expertise and our knowledge to provide them with something that's completely new. / Yeah / So in terms of actually communicating with him very regularly, apart from for meetings and to organize things, there's not too much need unless there's some sort of emergency it's more a case of going almost each, each meeting is a kind of tiny deliverable where we go in show him what we're doing, sometimes it's work in progress [?] That's one thing that's been quite hard travelling to and from London all the time. Long long days but it's been very necessary for this project, and I think it's really helped us stay on track with it and making sure we're always doing what [co name] want and appealing to our supervisor because obviously that's who essentially we're here to please. / It's a bit like in the early days um there was this lady from market research who was very helpful and there was a lot of email, at one point perhaps daily email communication with [name]. She was giving us feedback on a lot of the things we were doing and that was really helpful. / [?] like [co name] have a way that they kind of present things. And they like to see everything done in PowerPoint, even if it's a report, everything done in PowerPoint and converted to pdf [?] so that's a very obviously unique way to kind of display information. So when we were kind of putting together our initial reports that's y'know how we were kind of told to do it. So it's get our heads around how to kind of display that really. / We touched on something slightly different, it's probably a bit of an obstacle we faced recently was our final presentation, our final report, is very kind of detailed, content heavy but we're doing it in a presentation format, kind of communicating that to our project sponsor [name], giving him a presentation because they like to have their reports in presentation and he's kind of struggles to remember that it's a report and he thinks that's got a lot of detail in that for a presentation but no it's actually a report / it's not printed yet / once it's printed it'll be fine / it'll seem like a report won't it / it's just the mindset of seeing the presentation I think.</p>

I [1:06:17]	So, in terms of sharing the presentation, does Facebook support, or have you not loaded the presentation file on Facebook or has that had to be [?]
Team	It's more a case of [?] again if it's a small file you can upload [?] so we've uploaded it onto DropBox and say it's on DropBox, presentation version 3 is on the DropBox
I [1:06:42]	Is there a limit to the size of file you can put on DropBox?
Team	Oh it's huge, I think / [?] we've uploaded so much to it we are getting through it. / When I first saw it I thought it's a huge number of gig, and I was like god that's a lot [?] videos / when you sign up [?]
I [1:06:47 – time stuck]	And how have you shared lessons learnt? Has that been more at meetings or has that been through Facebook?
Team	Probably more at meetings, when we talk about things we've done recently / [?] We're quite often known for having quite lengthy discussions about how we can improve / yeah / moving forward, what's the best thing to do, in terms of like best practice / then when we're all like completely stuck we'll ask [?] [supervisor name]. [?] That's something we do a lot of as a group is, we have a lot of discussion which are not necessarily contributing to anything specific, they're about the project in general, we have a lot of overarching project discussions and talk a lot about what we've learnt [?] I don't really think we discuss lessons learnt on Facebook do we / No.
I [1:06:47?]	Ok, well that's been brilliant, thank you very much indeed.
Team	You're welcome.

### Appendix D: Example of stage one data analysis

**Stage one - Team B steps 2 to 4**

<b>Questions</b>	<b>Step 2</b> <i>Transfer data from transcript, by category.</i>	<b>Step 3</b> <i>Paraphrase data for conciseness and to make more manageable. Identify duplication and redundancy.</i>	<b>Step 4</b> <i>Remove duplication and combine data to form themes.</i>
What social media are used?	<ul style="list-style-type: none"> <li>i. Facebook group (p.1)</li> <li>ii. Share documents through Facebook (p.1)</li> <li>iii. DropBox (p.2)</li> <li>iv. Wiki (p.2) (organisational requirement)</li> <li>v. Facebook is instant to your phone (p.2)</li> <li>vi. DropBox on our phones (p.3)</li> <li>vii. originally set up a Skydrive (p.3)</li> <li>viii. share videos (p.7)</li> </ul>	<ul style="list-style-type: none"> <li>i. Social network - Facebook</li> <li>ii. Shared workspace - Facebook</li> <li>iii. Shared workspace – DropBox</li> <li>iv. Wiki (organisational requirement)</li> <li>v. Instant messaging – Facebook app</li> <li>vi. Shared workspace/notifications - DropBox app</li> <li>vii. Shared workspace - Skydrive</li> <li>viii. Video sharing</li> </ul>	<ul style="list-style-type: none"> <li>• Social network [SN] (i)</li> <li>• Shared workspace [SW] (i ii iv vi vii)</li> <li>• Instant messaging &amp; notifications [IM] (v vi)</li> <li>• Video sharing [VI] (viii)</li> </ul>
What factors influence choice/use?	<ul style="list-style-type: none"> <li>i. it [Facebook] was the main way we could discuss that as a group, as opposed to, so if you're texting each other it's only one person, whereas in a group you can actually collaborate. (p.1)</li> <li>ii. obviously we're all kind of connected to Facebook like 24/7 with our phones and everyone's on the Internet (p.1)</li> <li>iii. any kind of big document at all or any long lists we'll put on DropBox (p.2)</li> <li>iv. you can't upload very big files on Facebook (p.2)</li> <li>v. we don't use it for direct communication because there's no way to notify like, to notify if somebody's posted, we'd all have to check it with emails, whereas Facebook is instant to your phone. (p.2)</li> <li>vi. You can access it from anywhere by logging online and then everything that you've got in there comes up (p.2)</li> <li>vii. I've made it [DropBox] like [?] everybody can view everything that's in our folder. And you can also download it to your laptop and then it becomes a folder in your documents on your laptop, and then you don't have to go online to access it at all, everything instantly downloads every time you connect the Internet, any updates. It's really good (p.2)</li> <li>viii. there'd be no way to kind of actually communicate our message to somebody through DropBox (p.3)</li> <li>ix. I definitely do access a lot of what we do on Facebook and on DropBox on our phones, maybe not so much DropBox but</li> </ul>	<ul style="list-style-type: none"> <li>i. Support for discussions [Facebook]</li> <li>ii. Personal preferences, previous experience [Facebook]</li> <li>iii. Size of document [DropBox]</li> <li>iv. Size of document [Facebook]</li> <li>v. Capability for notifications [Facebook, DropBox]</li> <li>vi. Access over mobile phone / remote access [DropBox]</li> <li>vii. Document management capabilities [DropBox]</li> <li>viii. Capability for notifications [DropBox]</li> <li>ix. Mobile / remote access [Facebook, DropBox]</li> <li>x. Reliability, ease of use [DropBox]</li> <li>xi. Security [DropBox]</li> <li>xii. Size of team [Facebook]</li> <li>xiii. Social ties amongst team members [Facebook]</li> <li>xiv. Social ties [Facebook]</li> </ul>	<p>Technological factors</p> <ul style="list-style-type: none"> <li>• Support for discussions [SN,IM] (i)</li> <li>• Size of document [SN, SW] (iii iv)</li> <li>• Support for notifications [SN,SW] (v viii)</li> <li>• Accessible on mobile phone [SN,IM,SW] (vi ix)</li> <li>• Support for document management [SW] (vii)</li> <li>• Ease of use [SW] (x)</li> <li>• Reliability [SW] (x)</li> <li>• Security [SW] (xi)</li> </ul> <p>Task factors</p> <ul style="list-style-type: none"> <li>• Size of document/file [SN,SW] (iii iv)</li> <li>• Extent of conversation required [SN,IM] (xv)</li> </ul> <p>Team factors</p> <ul style="list-style-type: none"> <li>• Personal communication preferences [SN,IM] (ii)</li> </ul>

	<p>Facebook definitely I think / yeah / probably fifty percent of the time that I'm communicating on Facebook it's kind of on the go and I'm just doing it on my phone, it's just so easy it just pops up. (p.3)</p> <p>x. originally set up a Skydrive but I was getting frustrated with it cos I had a few problems, it wasn't working very well so I was like we're not using it anymore and did the DropBox instead ... Skydrive's much more temperamental, it's just not as solid software... with Skydrive you've always got to upload or download. Whereas with DropBox if you've got the actual thing downloaded, it's just really simple. (p.3)</p> <p>xi. And the other thing about it is you're worried about loosing work and if it's stored in an online space there's no worry about it disappearing so if it's on DropBox you're pretty much safe, no matter what happens you can get your work back if your laptop crashes or something like that (p.4)</p> <p>xii. So now maybe if, maybe twenty [in a team] plus I suppose might get kind of a bit / you might struggle (p.9)</p> <p>xiii. we're all friends anyway. (p.10)</p> <p>xiv. We've all been really good friends anyway from the beginning (p.11)</p> <p>xv. we do speak a lot via text and phone as well when it's something that needs more explanation than just a quick post on Facebook we need to talk about it (p.12)</p> <p>xvi. if it's a small file you can upload [to Facebook] so we've uploaded it onto DropBox and [use Facebook to say] say it's on DropBox (p.13)</p>	<p>xv. Extent of explanation required for a task [Facebook]</p> <p><del>xvi. Size of file [Facebook, DropBox]</del></p>	<ul style="list-style-type: none"> <li>• Previous experience [SN,IM] (ii)</li> <li>• Size of team [SN,IM] (xii)</li> <li>• Social ties [SN,IM] (xiii)</li> </ul>
<p>What behaviours /activities are involved in use of social media?</p>	<p>i. in terms of the day to day stuff, it's [Facebook] the primary source of communication for us. (p.1)</p> <p>ii. can share documents through Facebook. (p.1)</p> <p>iii. we kind of just kept in contact through the Facebook group (p.1)</p> <p>iv. kind of give feedback and things like so it was really really useful (p.1)</p> <p>v. often like an issue might arise in the project, or, something that needs an idea or something, so we'd just put it out there and the group someone will just post a message and say we've got this problem we've got this opportunity what does everyone think and then everyone can, in their own time, just say y'know ah we can do this, we can open conversation</p>	<p>i. Daily communication [Facebook]</p> <p>ii. Document sharing [Facebook]</p> <p><del>iii. Keeping in contact [Facebook]</del></p> <p>iv. Providing feedback [Facebook]</p> <p>v. Solving problems / managing change [Facebook]</p> <p><del>vi. Daily communication [Facebook]</del></p> <p><del>vii. Provide feedback [Facebook]</del></p> <p>viii. Reporting status and requesting feedback [Facebook]</p> <p>ix. Sharing work [DropBox]</p> <p>x. Sharing work updates [Facebook]</p>	<p>Engaging the team</p> <ul style="list-style-type: none"> <li>• Communication / keeping in contact with team members [SN,IM] (i)</li> <li>• Requesting and providing feedback (incl read notification) [SN,IM] (iv viii xxv)</li> <li>• Solving problems [SN,IM] (v)</li> <li>• Sharing informal information / questions [SN,IM] (xvii xx)</li> </ul>

	<p>whereas if you're on a phone call or a text or something, it's just not really as, as effective (p.1)</p> <p>vi. There's not a day that goes by that there's not a post on the Facebook group (p.1)</p> <p>vii. we're going to feedback if we can kind of think of anything else (p.1)</p> <p>viii. it's a great place [Facebook], rather than him send the list to each of us, then us each send separate lists back, he can just write a post on Facebook saying these are the few things I think I've got left and we can just comment on it, say if there's anything / but if there's a big list there it won't go in the safe group because we have a DropBox, all like joined by us, so we'll just say oh we've put it in the DropBox, see it there and comment on the Facebook group what we think (p.1-2)</p> <p>ix. DropBox is really good, you can basically just go in and edit things very easily and re-upload it and things like that so if had like a working draft you can have it on DropBox. (p.2)</p> <p>x. we use Facebook just to kind of inform the group that's something would be in DropBox (p.2)</p> <p>xi. I've made it like [?] everybody can view everything that's in our folder. (p.2)</p> <p>xii. That's the good thing about it [DropBox], it kind of synchronizes everytime you turn on your laptop and therefore you don't even need Internet because as long as you've had Internet for a period and it's downloaded everything, then you can just go on and use it and it'll upload it the next time you have Internet it will make it available to everybody else (p.2)</p> <p>xiii. managed our project in the beginning entirely through Facebook (p.5)</p> <p>xiv. in collaborating and in the form of discussion [Facebook] (p.5)</p> <p>xv. Facebook it'll just kind of be like can you get this done over the week end, can you get this done over the rest of the week (p.5-6)</p> <p>xvi. I quite often like will share videos and stuff (p.7)</p> <p>xvii. every time we kind of see something in the online or something like a viral ad that we think is quite relevant, we just post it on there / I do a lot of that / [?] yeah I do a lot of</p>	<p>xi. Storing and sharing information [DropBox]</p> <p>xii. <del>Storing and sharing information, and managing change [DropBox]</del></p> <p>xiii. Managing project [Facebook]</p> <p>xiv. Collaboration and discussion [Facebook]</p> <p>xv. Assigning tasks [Facebook]</p> <p>xvi. Sharing ideas [videos]</p> <p>xvii. Sharing informal information / brainstorming [Facebook]</p> <p>xviii. Organising meetings [Facebook]</p> <p>xix. Support for meetings [Facebook]</p> <p>xx. Asking / answering questions / supports meetings [Facebook]</p> <p><del>xxi. Requesting feedback [Facebook]</del></p> <p><del>xxii. Discussion [Facebook]</del></p> <p><del>xxiii. Communication [Facebook]</del></p> <p>xxiv. Asking / answering questions [Facebook]</p> <p>xxv. Provides read notification [Facebook]</p>	<ul style="list-style-type: none"> <li>• Discussion [SN,IM] (xiv)</li> <li>• Sharing ideas [VI,SN,IM] (xvi)</li> <li>• Brainstorming [SN,IM] (xvii)</li> <li>• Organising meetings [SN,IM] (xviii)</li> <li>• Support for meetings [SN,IM] (xix xx)</li> </ul> <p>Collaboration / project work</p> <ul style="list-style-type: none"> <li>• Sharing documents / information [SN,IM,SW] (ii xi)</li> <li>• Sharing work [SN,IM,SW] (ix x)</li> <li>• Storing information [SW] (xi)</li> </ul> <p>Managing the project</p> <ul style="list-style-type: none"> <li>• Managing change [SN,IM,SW] (v x xii)</li> <li>• Reporting status [SN,IM] (viii)</li> <li>• Managing project [SN] (xiii)</li> <li>• Assigning tasks [SN,IM] (xv)</li> </ul>
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	<p>that [laughter] / especially when we've got to, when we have to do a brainstorming session (p.7)</p> <p>xviii. I'll post on it saying which booth we are and where we're meeting, what time / there's a lot of kind of organising logistics of where and when we're gonna meeting and if someone's unavailable for whatever reason, there's a lot of that (p.7)</p> <p>xix. our Facebook activity correlates with our, how often we meet actually. / Which is quite strange [?] / we don't really use Facebook as a way of replacing the fact that we're not meeting for a week or something, because we're on holiday, or we're working on something else, um we use it as a way to complement the meetings we have and kind of fill in the gaps (p.8)</p> <p>xx. questions and someone can kind of respond in their own time. Yeah, it kind of complements the meetings really (p.8)</p> <p>xxi. if people are doing work it's like can you proof read this or can you do this bit, can you send me this bit over [using Facebook] (p.8)</p> <p>xxii. it's to just kind of to keep an ongoing discussion when we're in the midst of a heavy period of consultancy that we're working really hard on and we've got a deliverable coming up and we're most active (p.8)</p> <p>xxiii. our primary tool for communicating (p.9)</p> <p>xxiv. If someone has a query, they can post it to Facebook, they can tag somebody directly in it (p.10)</p> <p>xxv. has this thing called seen and it shows you how many people in that group have seen the post. (p.10)</p>		
<p>What are the perceptions of benefits and consequences of using social media?</p>	<p>i. you can actually collaborate and kind of give feedback (p.1)</p> <p>ii. we're all kind of connected to Facebook like 24/7 with our phones and everyone's on the Internet, so it's really just like, gives us the opportunity to, kind of constantly be connected like (p.1)</p> <p>iii. DropBox is really good, you can basically just go in and edit things very easily and re-upload it and things like that so if had like a working draft you can have it on DropBox (p.2)</p> <p>iv. You can access it [DropBox] from anywhere by logging online and then everything that you've got in there comes up (p.2)</p> <p>v. so you've just got this kind of seamless link if you want to do some work at home (p.3)</p>	<p>i. Improves collaboration and feedback [Facebook]</p> <p>ii. Feeling connected [Facebook]</p> <p>iii. Easy to use [DropBox]</p> <p>iv. Remote access [DropBox]</p> <p><del>v. Remote working [DropBox]</del></p> <p>vi. Efficiency [Facebook]</p> <p>vii. Loss of information / unrecorded information [Facebook]</p> <p><del>viii. Informality helps collaboration [Facebook]</del></p> <p>ix. Hinders because information less concise [Facebook]</p>	<p>Efficiency (vi,xx)</p> <ul style="list-style-type: none"> <li>Improves collaboration [SN,IM,SW] (i iii)</li> <li>Hinders because information less concise [SN,IM] (ix)</li> <li>immediacy [SN,IM] (xxii)</li> </ul> <p>Quality</p> <ul style="list-style-type: none"> <li>Improves feedback [SN,IM] (i)</li> </ul> <p>Information impacts</p>

	<p>vi. I think we've really learnt how they apply to our project and actually make the whole thing run so much more efficiently. (p.5)</p> <p>vii. actually it's not particularly formal and a lot of stuff goes kind of unregistered and unrecorded and things like that which is probably one of the downfalls of it (p.5)</p> <p>viii. It's [informality] a help in terms of, in collaborating and in the form of discussion, it's definitely a help in terms of that (p.5)</p> <p>ix. can hinder you is the way it's just a bit more kind of um spread out and less concise (p.5)</p> <p>x. overload (p.5)</p> <p>xi. overload rather than just having here are our set tasks and here's how long they should take, here's how long we've got budgeted for them, on Facebook it'll just kind of be like can you get this done over the week end (p.5)</p> <p>xii. if something pops up, outside of a meeting, that we kind of feel like we need to get done straight away, you might not, you might, cos it's quite informal we'll feel like oh we'll just put that task up there and see who's got time to kind of do that before the next meeting (p.6)</p> <p>xiii. the other thing is when people put things up late, when I've gone to bed, and for the next morning. (p.6)</p> <p>xiv. People are posting queries at like one in the morning like on things that just pop into your head and / literally it just comes into your head and you whack it onto the group ... [Interviewer: has that got positives and minuses?] Yeah, it has, because some of these things can wait. It's not so immediate but once it's thrown out there it's it's too late, everyone's thinking about it [?] there's no break, it means that there is never a holiday because people are always posting something on it. / I think the way you can look at things like that, in terms of our project it's probably a positive because it does mean that we have this constant communication and we constantly improve and get things done. But maybe in terms of our emotional welfare it's not that good [laughter] / it's the same thing with mobile phones though, because now if you have something to say you ring somebody but before you had to write a letter and wait a week. Now, everything's just a, everything's an emergency (p.6)</p>	<p>x. Overload [Facebook]</p> <p>xi. Pressure to work / dynamic task allocation [Facebook]</p> <p>xii. <del>Pressure</del>/flexibility to work at anytime [Facebook]</p> <p>xiii. <del>Flexibility to work at any time</del> [Facebook]</p> <p>xiv. <del>Pressure/flexibility to work at anytime</del> [Facebook]</p> <p>xv. Creative [to share videos/ideas]</p> <p>xvi. <del>Pressure/flexibility to work at anytime</del> [Facebook]</p> <p>xvii. Fills the gaps between meetings [Facebook]</p> <p>xviii. Questions/replies in own time [Facebook]</p> <p>xix. <del>Feeling connected</del> [Facebook]</p> <p>xx. Little effort [Facebook]</p> <p>xxi. Engaged with project / on the ball [Facebook]</p> <p>xxii. Immediacy / fast access to team and information [Facebook]</p> <p>xxiii. Accountability [Facebook]</p>	<ul style="list-style-type: none"> <li>• Loss of information [SN,IM] (vii)</li> <li>• Fills gaps between meetings [SN,IM] (xvii)</li> <li>• Informal information exchange [SN,IM] (xviii)</li> <li>• Faster information sharing [SN,IM] (xxii)</li> </ul> <p>Flexibility</p> <ul style="list-style-type: none"> <li>• can access from anywhere [SW] (iv)</li> <li>• dynamic task allocation [SN,IM] (xi)</li> <li>• can work anytime [SN,IM] (xii)</li> </ul> <p>Creativity [VC,SN] (xv)</p> <ul style="list-style-type: none"> <li>• sharing ideas [VC,SN,IM] (xv)</li> </ul> <p>Transparency</p> <ul style="list-style-type: none"> <li>• accountability [SN,IM] (xxiii)</li> </ul> <p>Emotional impacts</p> <ul style="list-style-type: none"> <li>• feeling connected [SN,IM] (ii)</li> <li>• Overload [SN,IM] (x)</li> <li>• pressure to work [SN,IM] (xi)</li> <li>• feel engaged ("on the ball") [SN,IM] (xxi)</li> </ul>
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	<p>xv. I think as well I quite often like will share videos and stuff like off the back of this obviously like quite a large element of our project is a creative element, we've got to kind of create like this brand y'know every time we kind of see something in the online or something like a viral ad that we think is quite relevant, we just post it on there (p.7)</p> <p>xvi. If it says there's been five or six since I've last checked it I think something like big must have happened because everyone's posting and like what have I missed (p.7)</p> <p>xvii. kind of fill in the gaps (p.8)</p> <p>xviii. you can ask questions and someone can kind of respond in their own time. Yeah, it kind of complements the meetings really. (p.8)</p> <p>xix. I think you wouldn't feel as connected as we do with Facebook (p.8)</p> <p>xx. we go on Facebook a lot because of our group stuff but also you are on Facebook a little bit of the time anyway so it doesn't seem much effort (p.8)</p> <p>xxi. I can't think of any ways it's affecting it negatively, cos it definitely keeps us much more engaged with the project, definitely keeps us much more kind of on the ball with the project (p.10)</p> <p>xxii. I guess it's the immediacy thing. If someone has a query, they can post it to Facebook, they can tag somebody directly in it. If there's something they want to post to directly and then people can reply very quickly (p.10)</p> <p>xxiii. there's kind of no excuse as to why you've not replied, because you've read it and you've been on Facebook. / A degree of accountability as well like, you can't say oh no I didn't see that (p.10)</p>		
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## **Appendix E: Results of Stage one data analysis step 5**

**Stage one - Recursive data abstraction – step five**

<b>Questions</b>	<b>Team A</b> Output from step four	<b>Team B</b> Output from step 4	<b>Step 5</b> <i>Compare and combine themes, develop constructs and codes</i>
What social media are used?	<ul style="list-style-type: none"> <li>• Social network [SN]</li> <li>• Shared workspace [SW]</li> <li>• Instant messaging &amp; notifications [IM]</li> <li>• Video sharing [VI]</li> <li>• Online meetings [OM]</li> <li>• Micro blog [MB]</li> </ul>	<ul style="list-style-type: none"> <li>• Social network [SN]</li> <li>• Shared workspace [SW]</li> <li>• Instant messaging &amp; notifications [IM]</li> <li>• Video sharing [VI]</li> </ul>	SN Social network SW Shared workspace IM Instant messaging & notifications VI Video sharing OM Online meetings MB Micro blog
What factors influence choice/use?	<p>Technological factors</p> <ul style="list-style-type: none"> <li>• Support for messaging [SN,IM]</li> <li>• Support for project management [SN,IM]</li> <li>• File format/s supported [SW,SN,IM]</li> <li>• Support for synchronous editing [SW]</li> <li>• Cost [SN,IM,SW]</li> <li>• Customisation [SN,IM,SW]</li> <li>• Ease of use [SN,IM,SW]</li> <li>• Accessible on mobile phone [SN,IM,SW]</li> </ul> <p>Task factors</p> <ul style="list-style-type: none"> <li>• Extent of conversation required [SN,IM]</li> </ul> <p>Team factors</p> <ul style="list-style-type: none"> <li>• Prior experience [SN,IM]</li> <li>• Communication preference [SN,IM]</li> <li>• Social ties [SN,IM]</li> </ul>	<p>Technological factors</p> <ul style="list-style-type: none"> <li>• Support for discussions [SN,IM]</li> <li>• Size of document [SN,SW]</li> <li>• Support for notifications [SN,SW]</li> <li>• Accessible on mobile phone [SN,IM,SW]</li> <li>• Support for document management [SW]</li> <li>• Ease of use [SW]</li> <li>• Reliability [SW]</li> <li>• Security [SW]</li> </ul> <p>Task factors</p> <ul style="list-style-type: none"> <li>• Size of document/file [SN,SW]</li> <li>• Extent of conversation required [SN,IM]</li> </ul> <p>Team factors</p> <ul style="list-style-type: none"> <li>• Personal communication preferences [SN,IM]</li> <li>• Previous experience [SN,IM]</li> <li>• Size of team [SN,IM]</li> <li>• Social ties [SN,IM]</li> </ul>	<p><b>Technological factors</b></p> Ft1 Accessible on mobile phone [SN,IM,SW] Ft2 Ease of use [SN,IM,SW] Ft3 Customisation [SN,IM,SW] Ft4 Cost [SN,IM,SW] Ft5 Reliability [SW] Ft6 Functionality, support for Ft6a project management [SN,IM] Ft6b document management [SW] Ft6c synchronous document editing [SW] Ft6d file size and formats [SN,SW] Ft6e discussions [SN,IM] Ft6f messaging/notifications [SN,IM,SW] Ft7 Security [SW]  <p><b>Task factors</b></p> Fk1 Extent of conversation required [SN,IM] Fk2 Size/format of file/s involved [SN,SW]  <p><b>Team factors</b></p> Fm1 Communication preferences [SN,IM] Fm2 Prior experience [SN,IM] Fm3 Social ties [SN,IM] Fm4 Size of team [SN,IM]

Questions	Team A Output from step four	Team B Output from step 4	Step 5 <i>Compare and combine themes, develop constructs and codes</i>
<p>What behaviours /activities are involved in use of social media?</p>	<p>Engaging the team</p> <ul style="list-style-type: none"> <li>• Internal communication [SN,IM]</li> <li>• Organising meetings [SN,IM]</li> <li>• Supporting meetings [SN,IM,SW]</li> <li>• Informal information sharing [SN,IM]</li> <li>• Reminders and prompts [SN,IM]</li> <li>• Requesting and providing feedback [SN,IM]</li> <li>• Conducting meetings [OM]</li> </ul> <p>Collaboration / project work</p> <ul style="list-style-type: none"> <li>• Knowledge sharing [SN,IM,SW]</li> <li>• Sharing work [SW,SN,IM]</li> <li>• Document management [SN,SW]</li> </ul> <p>Managing the project</p> <ul style="list-style-type: none"> <li>• Making decisions [SM,IM]</li> <li>• Assigning tasks &amp; recording task allocation [SN,IM]</li> <li>• Checking work progress [SN,IM]</li> <li>• Status reporting [SN,IM]</li> <li>• Managing change [SN,IM,SW]</li> <li>• Project diary [VI]</li> <li>• Capturing lessons learnt [VI]</li> </ul>	<p>Engaging the team</p> <ul style="list-style-type: none"> <li>• Communication / keeping in contact with team members [SN,IM]</li> <li>• Requesting and providing feedback (incl read notification) [SN,IM]</li> <li>• Solving problems [SN,IM]</li> <li>• Sharing informal information / questions [SN,IM]</li> <li>• Discussion [SN,IM]</li> <li>• Sharing ideas [VI,SN,IM]</li> <li>• Brainstorming [SN,IM]</li> <li>• Organising meetings [SN,IM]</li> <li>• Support for meetings [SN,IM]</li> </ul> <p>Collaboration / project work</p> <ul style="list-style-type: none"> <li>• Sharing documents / information [SN,IM,SW]</li> <li>• Sharing work [SN,IM,SW]</li> <li>• Storing information [SW]</li> </ul> <p>Managing the project</p> <ul style="list-style-type: none"> <li>• Managing change [SN,IM,SW]</li> <li>• Reporting status [SN,IM]</li> <li>• Managing project [SN]</li> <li>• Assigning tasks [SN,IM]</li> </ul>	<p><b>Engaging the team</b></p> <p>Ae1 Organising and support for meetings [SN,IM]  Ae2 Conducting meetings [OM]  Ae3 Informal information sharing [SN,IM]  Ae4 Requesting and providing feedback [SN,IM]  Ae5 Reminders and prompts [SN,IM]  Ae6 Solving problems and discussion [SN,IM]  Ae7 Brainstorming and sharing ideas [VI,SN,IM]  Ae8 Keeping in contact [SN,IM]</p> <p><b>Project work</b></p> <p>Aw1 Storing information [SW,SN]  Aw2 Sharing information [SW,SN,IM]  Aw3 Sharing work [SW,SN,IM]</p> <p><b>Management Activities</b></p> <p>Am1 Assigning tasks &amp; recording allocation [SN,IM]  Am2 Checking work progress [SN,IM]  Am3 Reporting task status [SN,IM]  Am4 Decision making [SM,IM]  Am5 Project diary [VI]  Am6 Change management [SN,IM,SW]  Am7 Capturing lessons learnt [VI]</p>

Questions	Team A Output from step four	Team B Output from step 4	Step 5 <i>Compare and combine themes, develop constructs and codes</i>
<p>What behaviours /activities are involved in use of social media? Contd.</p>	<p>External communication</p> <ul style="list-style-type: none"> <li>• Gathering external info [MB]</li> <li>• Sharing information externally [MB,VI]</li> </ul>		<p><b>Communication across the project boundary</b>            Ab1 Distributing information externally [MB,VI]            Ab2 Gathering external information [MB]</p>
<p>What are the perceptions of benefits and consequences of using social media?</p>	<p>Efficiency</p> <ul style="list-style-type: none"> <li>• Synchronous document editing [SW]</li> <li>• Saves time [SN,IM,SW,MB]</li> <li>• Driving project forward [SN,IM]</li> <li>• Reduces need to meet physically [SN,IM]</li> </ul> <p>Quality</p> <ul style="list-style-type: none"> <li>• Feedback [SN,IM]</li> </ul> <p>Information impacts</p> <ul style="list-style-type: none"> <li>• Eliminates need to send documents [SW]</li> <li>• Saves duplication [SW] (iii)</li> <li>• Sharing informal information [SN,IM]</li> <li>• Facilitates information gathering [MB]</li> <li>• Easy to share information [MB]</li> </ul> <p>Flexibility</p> <ul style="list-style-type: none"> <li>• Dynamic task allocation [SN,IM]</li> <li>• Working in own time/place [SN,IM,SW]</li> </ul>	<p>Efficiency</p> <ul style="list-style-type: none"> <li>• Improves collaboration [SN,IM,SW]</li> <li>• Hinders because information less concise [SN,IM]</li> <li>• immediacy [SN,IM]</li> </ul> <p>Quality</p> <ul style="list-style-type: none"> <li>• Improves feedback [SN,IM]</li> </ul> <p>Information impacts</p> <ul style="list-style-type: none"> <li>• Loss of information [SN,IM]</li> <li>• Fills gaps between meetings [SN,IM]</li> <li>• Informal information exchange [SN,IM]</li> <li>• Faster information sharing [SN,IM]</li> </ul> <p>Flexibility</p> <ul style="list-style-type: none"> <li>• can access from anywhere [SW]</li> <li>• dynamic task allocation [SN,IM]</li> <li>• can work anytime [SN,IM]</li> </ul>	<p><b>Efficiency impacts</b>            Is1 + Saves time/immediacy/easy to use [SN,IM,SW,MB]            Is2 + Reduces need to meet physically [SN,IM]            Is3 + Synchronous document editing [SW]            Is4 + Driving project forward [SN,IM]            Is5 - Less concise [SN,IM]</p> <p><b>Quality of work</b>            Iq1 + Feedback improves quality [SN,IM]</p> <p><b>Information management</b>            Im1 + Eliminates need to send documents [SW]            Im2 + Easier information sharing [MB]            Im3 + Faster information sharing [SN,IM]            Im4 + Saves duplication [SW]            Im5 + Facilitates information sharing / Fills gaps [SN,IM]            Im6 - Information loss [SN,IM]</p> <p><b>Flexibility</b>            If1 + Ability to work in own time [SW,SN,IM]            If2 + Ability to work at any location [SW,SN,IM]            If3 + Dynamic task allocation [SN,IM]</p>

<b>Questions</b>	<b>Team A</b> Output from step four	<b>Team B</b> Output from step 4	<b>Step 5</b> <i>Compare and combine themes, develop constructs and codes</i>
<p>What are the perceptions of benefits and consequences of using social media? Contd.</p>	<p>Creativity [VC,SN]</p> <ul style="list-style-type: none"> <li>• Stimulates thinking [VI]</li> </ul> <p>Transparency</p> <ul style="list-style-type: none"> <li>• all have the same information [SN,IM,SW]</li> <li>• All on same level [SN,IM,SW]</li> <li>• Visibility of work and status [SN,IM]</li> </ul> <p>Emotional impacts</p> <ul style="list-style-type: none"> <li>• motivation, pressure to work [SN,IM]</li> <li>• fear of letting team down [SN,IM]</li> <li>• Enjoyment [VI]</li> <li>• feel “on the ball” [SN,IM]</li> </ul>	<p>Creativity [VC,SN] (xv)</p> <ul style="list-style-type: none"> <li>• sharing ideas [VC,SN,IM]</li> </ul> <p>Transparency</p> <ul style="list-style-type: none"> <li>• accountability [SN,IM]</li> </ul> <p>Emotional impacts</p> <ul style="list-style-type: none"> <li>• feeling connected [SN,IM]</li> <li>• Overload [SN,IM]</li> <li>• pressure to work [SN,IM]</li> <li>• feel engaged (“on the ball”) [SN,IM]</li> </ul>	<p><b>Creativity</b></p> <p>Ic1 + Facilitates sharing ideas [SN,IM,VI] Ic2 + Stimulates thinking [VI]</p> <p><b>Transparency</b></p> <p>It1 + All have same information / flattens the structure [SN,IM,SW] It2 + Visibility of work and status [SN,IM] It3 + Accountability [SN,IM]</p> <p><b>Emotional impacts</b></p> <p>Ie1 + Encourages participation(motivation to work) [SN,IM] Ie2 + Increases focus/engagement [SN,IM] Ie3 + Enjoyment [VI] Ie4 + Feeling connected [SN,IM] Ie5 - Fear of overload [SN,IM] Ie6 - Fear of letting team down [SN,IM]</p>

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## Appendix F: Example of stage two data analysis results

### Stage two – Individual D steps 2 to 4

Questions	Step 2	Step 3	Step 4
What social media are used?	<ul style="list-style-type: none"> <li>i. Facebook (p.1)</li> <li>ii. Facebook chat (p.1)</li> </ul>	<ul style="list-style-type: none"> <li>i. Social network</li> <li>ii. Instant messaging</li> </ul>	<ul style="list-style-type: none"> <li>i. SN ) Note: Both types</li> <li>ii. IM ) relevant to all categories below</li> </ul>
What factors influence choice/use?	<ul style="list-style-type: none"> <li>i. the great advantage of Facebook is that you can set up groups where only, certain individuals within your group are part of it (p.1)</li> <li>ii. it kind'o depends on what everyone else has (p.1)</li> <li>iii. easy to use for projects (p.1)</li> </ul>	<ul style="list-style-type: none"> <li>i. group chat</li> <li>ii. prior experience/access</li> <li>iii. ease of use</li> </ul>	<ul style="list-style-type: none"> <li>i. Ft6e</li> <li>ii. Fm2</li> <li>iii. Ft2</li> </ul>
What behaviours /activities are involved in use of social media?	<ul style="list-style-type: none"> <li>i. it's [Facebook] great to organize meetings (p.1)</li> <li>ii. you can upload the work you've done (p.1)</li> <li>iii. and we can post how far we've got over a certain time frame (p.1)</li> <li>iv. can set deadlines you want, individual deadlines for each other.(p.1)</li> <li>v. organized meetings (p.1)</li> <li>vi. organized meetings on there, um and then like I said earlier we could post the work that we've done which means everyone else could assess it look at it y'know give improvements or modify it themselves (p.1)</li> <li>vii. our Facebook page so, er, it enabled us to connect with a lot more people (p.3)</li> </ul>	<ul style="list-style-type: none"> <li>i. organize meetings</li> <li>ii. sharing work</li> <li>iii. report task status</li> <li>iv. set deadlines</li> <li>v. <del>organize meetings</del></li> <li>vi. requesting and providing feedback</li> <li>vii. contacting with external people</li> </ul>	<ul style="list-style-type: none"> <li>i. Ae1</li> <li>ii. Aw3</li> <li>iii. Am3</li> <li>iv. Am1</li> <li>v. <del>Ae1</del></li> <li>vi. Ae4</li> <li>vii. Ab3</li> </ul>
What are the perceptions of benefits and consequences of using social media?	<ul style="list-style-type: none"> <li>i. a little bit of quality control, make sure everyone knows what you're doing. (p.2)</li> <li>ii. so it makes it a lot easier [information sharing], it increases the chance of success cos, as I said communication is important and everyone's gonna see I, and, um, there's less chance of mistakes in your work cos as I said you can have more eyes looking over it (p.2)</li> <li>iii. it's made it a lot easier (p.2)</li> </ul>	<ul style="list-style-type: none"> <li>i. quality improvement</li> <li>ii. easier information sharing, quality improvement</li> <li>iii. <del>easier information sharing</del></li> </ul>	<ul style="list-style-type: none"> <li>i. Iq1</li> <li>ii. Im2</li> <li>iii. <del>Im2</del></li> </ul>

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## Appendix G: Example of stage three data analysis results

### Stage three – Group Z steps 2 to 4

Questions	Step 2	Step 3	Step 4 (New codes in bold)
What social media are used?	<ul style="list-style-type: none"> <li>i. SSN (p.1)</li> <li>ii. VM Ware (p.3)</li> <li>iii. SharePoint (p.3)</li> <li>iv. [SharePoint] notifications (p.4)</li> <li>v. [SSN] notifications (p.4)</li> </ul>	<ul style="list-style-type: none"> <li>i. Social network</li> <li><del>ii. Social network software</del></li> <li>iii. Shared workspace</li> <li>iv. Notifications</li> <li><del>v. Notifications</del></li> </ul>	<ul style="list-style-type: none"> <li>i. SN</li> <li><del>ii. SN</del></li> <li>iii. SW</li> <li>iv. IM</li> <li><del>v. IM</del></li> </ul>
What factors influence choice/use?	<ul style="list-style-type: none"> <li>i. I definitely think it benefits us being from the generation we're from and having Facebook and all of that sort of thing, we're very much familiar with it from the start (p.1)</li> <li>ii. translation requirements (p.2)</li> <li>iii. specific privacy, sort, it comes from Germany and privacy laws (p.2)</li> <li>iv. on SSN you can't actually share documents, you can only file, share images, or PDFs (p.3)</li> <li>v. [company name]ve chosen not to allow and to restrict to PDFs and images on the basis they don't want it to be used as a storage platform (p.3)</li> <li>vi. I'm assuming there's something to do with cost implications (p.3)</li> <li>vii. Share Point, because that has version control ... um you'd be able to go in, open that document, edit it, save it back as a different version (p.3)</li> <li>viii. Dynamic in Google Docs is obviously the way to go, but I understand why [company name] as a large corporate couldn't host secure, confidential documents with someone like Google. So we have to have the SharePoint platform available, and I'm assuming it's hosted on some secure server somewhere so it's confidential.(p.3)</li> <li>ix. so it would be for you to be reactive, proactive in going to do that rather than the system automatically doing it for you.(p.4)</li> <li>x. I'm sat in proximity to someone I'm working with maybe here in Poole I'd be less likely to set up a um er SSN group for that. I'd be less likely to set one up if there was a small amount of people (p.5)</li> <li>xi. in the UK it is factually correct to say that they are an average of white male thirty five engineers. That is our</li> </ul>	<ul style="list-style-type: none"> <li>i. Generation, prior experience [SN]</li> <li>ii. Translation requirement [SN]</li> <li>iii. Privacy [SN]</li> <li>iv. Document management [SN,SW], file format [SN]</li> <li>v. Internal policy [SN]</li> <li>vi. Cost [SN]</li> <li><del>vii. Document management [SW]</del></li> <li>viii. Security [SW]</li> <li>ix. Personal communications preference [SN, IM]</li> <li>x. Geographic distance, team size [SN]</li> <li>xi. Age / generation [SN]</li> <li>xii. Management support [SN]</li> <li><del>xiii. Age / generation [SN]</del></li> <li>xiv. Prior experience / knowledge [SN]</li> <li><del>xv. Prior experience [SN]</del></li> <li>xvi. Experience from personal use [SN]</li> <li>xvii. Job role [SN]</li> <li><del>xviii. Job role [SN]</del></li> <li>xix. Personal communications preference [SN]</li> <li><del>xx. Management support [SN]</del></li> <li>xxi. Internal policy [SN]</li> </ul>	<ul style="list-style-type: none"> <li>i. Fm5 [SN]</li> <li>ii. <b>Functionality, translation - Ft6g [SN]</b></li> <li>iii. Ft7 [SN]</li> <li>iv. Ft6b [SN, SW], Ft6d [SN]</li> <li>v. Fo2 [SN]</li> <li>vi. Ft4 [SN]</li> <li><del>vii. Ft6b [SW]</del></li> <li>viii. Ft7 [SW]</li> <li>ix. Fm1 [SN, IM]</li> <li>x. <b>Geographic distance – Fm8 [SN] Fm4 [SN]</b></li> <li>xi. Fm5 [SN]</li> <li>xii. <b>Management support – Fo3 [SN]</b></li> <li><del>xiii. Fm5 [SN]</del></li> <li>xiv. Fm2 [SN]</li> <li><del>xv. Fm2</del></li> <li><b>xvi. Personal use [SN] – add to Fm2</b></li> <li><b>xvii. Job role – Fm9 [SN]</b></li> <li><del>xviii. Fm9 [SN]</del></li> <li>xix. Fm1 [SN]</li> <li><del>xx. Fo3 [SN]</del></li> <li><b>xxi. Policy [SN] – add to Fo2</b></li> </ul>

	<p>demographic as an average across the UK. So that comes with a cultural um difficulty, challenge, whatever you want to call it, in terms of using social media and what it's there to do, and perhaps some of the um scary, the scary part of it. (p.5)</p> <p>xii. management push down the organisation especially in the UK to try and get the senior management team on there to be using it, to be leading by example. (p.5)</p> <p>xiii. I think if you implemented something like that in a relatively new um with a demographic that was perhaps of a different era, um, yeah, I think it would be a lot easier to do. (p.5)</p> <p>xiv. I think when they said that they don't like social media, or they don't like um, SSN, it's it's just the I think it's just the naivety they don't know what it is yet.(p.6)</p> <p>xv. I think sometimes it's just lack of, knowledge, lack of acceptance, with a new. People don't really like change. (p.6)</p> <p>xvi. we have people that have never used social media outside of their, their professional working life and therefore they find it really scary, they've never touched it before personal or professional. Then we have people that have used it in their personal life and in work and they understand it and they pick it up really really easily. And then you get these people that sit in the middle that use it for their personal life but can't relate it to their working world and they are the difficultest people to target, because they can't translate how they use Facebook, Twitter, LinkedIn, and all those personal ones in the working world. They are our biggest challenge, and I thought that was a really interesting thing that she, she mentioned, and I thought that's quite accurate actually. (p.6)</p> <p>xvii. depending on their job role ... it's about their job role. If you're doing an operational, day to day, um role, the likelihood of you having to use it if it weren't for the end user support that we're trying to promote through the tool, the likelihood of you using it is probably slightly less than you would be if you were maybe working in a slightly different role where you were doing a lot of project based temporary work where you were moving around and it was a bit more fluid. (p.6)</p> <p>xviii. SSN is very much part of my job role</p>		
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	<p>xix. if I turn my phone off when I finish work then I wouldn't get notifications, so it's my choice to then turn my phone on again and get notifications. So it just depends on what sort of person you are I guess whether you. (p.7)</p> <p>xx. I did have a conversation with the graduates about SSN and I was quite surprised, cos they're obviously around my age, um or younger, and some of them weren't, sold like sold on the tool, they didn't use it that much in their jobs, and I think that does filter down from perhaps management, maybe. Erm, we need to get the management buy in, to get the employee buy in, no matter what age they are.(p.7)</p> <p>xxi. So we have a PM, the [company name] methodology that you have to hit certain milestones, 'n quality gates etcetera along the process. But if there was some sort of direction from there, or instructions, people would be much more likely to buy into the idea of perhaps using SSN as a place to, to host their projects and talk about their projects. (p.7)</p>		
<p>What behaviours /activities are involved in use of social media?</p>	<p>i. So I use it on specific comms campaigns. So I might use um hash tags against comms campaigns and then search for those hash tags and then analyse sort of who's been commenting, who's been liking those posts, um. (p.1)</p> <p>ii. to post top tips, and um end user support on everything to do with IT products and services. (p.1)</p> <p>iii. team collaboration, we've got the UK graduate group on SSN so we all keep in touch through that on different events, um chatting. And then we've got team groups as well, so I'll stay in contact with my team on SSN. Um, and then IT Europe one group, so we stay in touch with all the employees within IT Europe one. (p.1)</p> <p>iv. posting updates on projects (p.1)</p> <p>v. we had an unplanned issue, recently, with a home page not working, so one of my colleagues posted that on SSN (p.1)</p> <p>vi. the beauty of SSN is that if that message was posted to a group where perhaps [Z1 name] hadn't been able, available to pick it up, then if someone sent an email just to [Z1 name] that would have been in only [Z1 name]'s email box, so actually, if [Z1 name] wasn't able to do it then maybe one of your colleagues was able to pick it up in that instance. So, it, we are really looking at it as a many to many type of communication rather than just one to many you get with email (p.1-2)</p>	<p>i. Obtaining feedback [SN]  ii. Helping others [SN]  iii. Keeping in contact [SN]  iv. Reporting status [SN]  v. Managing change [SN]  vi. Informal information sharing [SN,IM]  vii. Contacting external experts [SN]  viii. Contacting other people [SN]  ix. External communication [SN]  x. Informal information sharing [SN]  xi. Sharing information [SW, SN]  xii. Sharing work [SW]  xiii. Sharing work [SN, IM]  xiv. Storing information [SW]  xv. Change management [SN,IM]  xvi. Discussion [SN, IM]  xvii. Receive feedback [SN]  xviii. Keeping in contact, support for meetings [SN]  xix. Helping others [SN]</p>	<p>i. Ae4 [SN]  ii. Ae8 [SN]  <del>iii. Ae8 [SN]</del>  iv. Am3 [SN]  <del>v. Am6 [SN]</del>  vi. Ae3 [SN,IM]  vii. Ab3 [SN]  <del>viii. Ab3 [SN]</del>  ix. Ab1, Ab2 [SN]  <del>x. Ae3 [SN]</del>  xi. Aw2 [SW, SN]  <del>xii. Aw3 [SW]</del>  xiii. Aw3 [SN, IM]  xiv. Aw1 [SW]  xv. Am6 [SN,IM]  xvi. Ae6 [SN, IM]  <del>xvii. Ae4 [SN]</del>  xviii. Ae8, Ae1 [SN]  <del>xix. Ae8 [SN]</del></p>

	<ul style="list-style-type: none"> <li>vii. it opens the door to an expert you might not even know is there (p.2)</li> <li>viii. opening up the expertise to those two hundred and thirty people within IT that you might not talk to on a daily basis.(p.2)</li> <li>ix. So, the distance between people, y'know we really are now working in a virtualized organisation, and to be able to communicate with various different people from Spain, Madrid, Portugal, you name it, SSN enables us to do that in a much more virtual way, collaborative way, than we've ever had previously, um, we've never had that ability previously, and I think because we've gone a bit more global, a bit more regional, y'know things like social network have become even more important than they were previously. (p.2)</li> <li>x. if we're sharing information on SSN we just insert the link. (p.3)</li> <li>xi. So therefore we use Share Point as [Z1 name] rightly said we'll take that unique URL and we'll upload that onto the SSN so people can find that document, if required, or you'd convert it to a PDF and then share it that way (p.3)</li> <li>xii. you have this check in check out functionality and version control which allows us to do that [share work]. (p.3)</li> <li>xiii. if I was to update a document and I need, if I was working on that document with someone and I updated it, I'd more likely to let them know via SSN. (p.4)</li> <li>xiv. a good backup (p.4)</li> <li>xv. you get a notification when someone posts on that group. (p.4)</li> <li>xvi. set up that hash tag as a stream and then any, anytime that follow people's messages. So if someone's um made a notification no matter who it is, if they've posted it on their er activity stream, you can right click on that and follow their, their message replies. (p.4)</li> <li>xvii. we can measure is the amount of likes and the amount of comments (p.4)</li> <li>xviii. So we've used an SSN group to remain in contact with each other, share the documentation, um talk about meetings, talk about agenda items, ask about where things have gone missing or who's got them etcetera. (p.5)</li> <li>xix. if I see someone's got an IT question that I could help with or it doesn't matter, a question or a concern, I could then</li> </ul>		
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	<p>post, as a normal user, or anyone can, to say hi [Z1 name]          this is the answer or you could find the information here          here's the link (p.8)</p>		
<p>What are the perceptions of benefits and consequences of using social media?</p>	<ul style="list-style-type: none"> <li>i. I was able to see it straight away ... to react to that in a really quick time, ... um, so I think that is a real benefit of that (p.1-2)</li> <li>ii. There's loads of different ways you can sort of stay on top of activity, and if you don't want to, there's also ways you can turn all of that off, and just go and retrieve information from SSN as and when you want it. (p.4)</li> <li>iii. they feel very uncomfortable, they feel unsure about where they're posting things, and what does that mean, who's watching them, are they going to get in trouble if they say the wrong thing, the language etcetera.(p.5)</li> <li>iv. It's quick to get answers (p.8)</li> <li>v. transparency, collaboration, and just an open environment really. Ownership, culture (p.8)</li> <li>vi. it's their responsibility to go and get that information from SSN, they can [?] go and pull that information themselves rather than just waiting for it to come to them. So they're owning that content. (p.8)</li> <li>vii. it's about being able to help fellow colleagues as well and being responsible and being part of that family (p.8)</li> <li>viii. gives more validity to their answer. (p.8)</li> </ul>	<ul style="list-style-type: none"> <li>i. Faster information sharing [SN]</li> <li>ii. Not missing information [SN]</li> <li>iii. Fear of mistakes [SN]</li> <li>iv. Faster information sharing [SN]</li> <li>v. Transparency, all have same information [SN]</li> <li>vi. Accountability [SN]</li> <li>vii. Feeling connected [SN]</li> <li>viii. Accountability [SN]</li> </ul>	<ul style="list-style-type: none"> <li>i. Im3 [SN]</li> <li>ii. Im9 [SN]</li> <li>iii. <b>Fear of mistakes – add to le6 [SN]</b></li> <li>iv. <del>Im3 [SN]</del></li> <li>v. It1 [SN]</li> <li>vi. It3 [SN]</li> <li>vii. le4 [SN]</li> <li>viii. <del>It3 [SN]</del></li> </ul>

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## **Appendix H: Example of validation data analysis results**

Validation – Individual H steps 2 to 4

Questions	Step 2	Step 3	Step 4 (New codes in bold)
What social media are used?	i. Basecamp and everything, but we are, we do sneak into like Skype, Slack and even WhatsApp (p.1)	i. Shared workspace/instant messaging, online meetings, instant messaging	i. SW, IM, OM
What factors influence choice/use?	i. didn't really know about the tools that are possible to use in the industry ... So I think maybe they use some of it because there're not aware of the other tools that are out there as well. (p.1) ii. Or the other tools cost, so, from a student's point of view you want it at minimum cost don't you. (p.1)	i. Prior knowledge ii. Cost	<b>i. Prior knowledge – add to Fm2 [SW, IM]</b> ii. Ft4 [SW, IM]
What behaviours /activities are involved in use of social media?	i. I've had clients message me on WhatsApp ... we'll manage it all on Basecamp and I'll keep that all up to date for the client, and then they'll jump onto Skype cos something urgent's come up (p.1) ii. you can just keep everyone so up to date (p.1) iii. keeping the communication going (p.1) iv. if something happens late at night, you see the team jump on it. And it's a really nice team feeling, when you see oh someone go, oh let me just test that, and I'll check that, and then you see so and so can you just do this (p.2)	i. Reporting status [SW, IM], managing change [SW,IM,OM], keeping in contact [OM] ii. <del>Reporting status</del> , keeping in contact [SW, IM] iii. <del>Keeping in contact</del> [SW, IM] iv. <del>Managing change</del> , sharing work, solving problems, assigning tasks [IM]	i. Am3 [SW,IM], Am6 [SW,IM], Ae8 [OM] ii. <del>Am3</del> [SW,IM], Ae8 [SW,IM] iii. <del>Ae8</del> [SW,IM] iv. <del>Ae8</del> [SW,IM] v. Am6, Aw3, Ae6, Am1 [IM]
What are the perceptions of benefits and consequences of using social media?	i. you can feel a little bit harassed by it in the industry (p.1) ii. they're based over in Austria, and, because of that, and the work we're going to do in the future, they don't think we need to be there as much as they first anticipated because that we've shown, we've shown that we can manage it through the tools that are available. (p.1) iii. just being open and keeping the communication going ... they can see that it's in control, so they actually don't need to worry about it. (p.1) iv. Basecamp might not necessarily engage them, but Slack probably does ... if something happens late at night, you see the team jump on it. And it's a really nice team feeling ... everyone pulls together. (p.2) v. you do kinda get that connection and, trust, and y'know team spirit. (p.2)	i. Feeling harassed [IM] ii. Geographic flexibility [SW,IM,OM] iii. All having same information [SW,IM] iv. Feeling engaged, fast information sharing, flexibility to work at any time, dynamic allocation of work [IM] v. <del>Feeling connected</del> , trust [IM]	<b>i. Feeling harassed - le9 [IM]</b> ii. If2 [SW,IM,OM] iii. It1 [SW,IM] iv. le4, lm3, lf1, lf3 [IM] v. <del>le4</del> , le7 [IM]

## **Appendix I: Consolidated research findings (duplicate diagram)**

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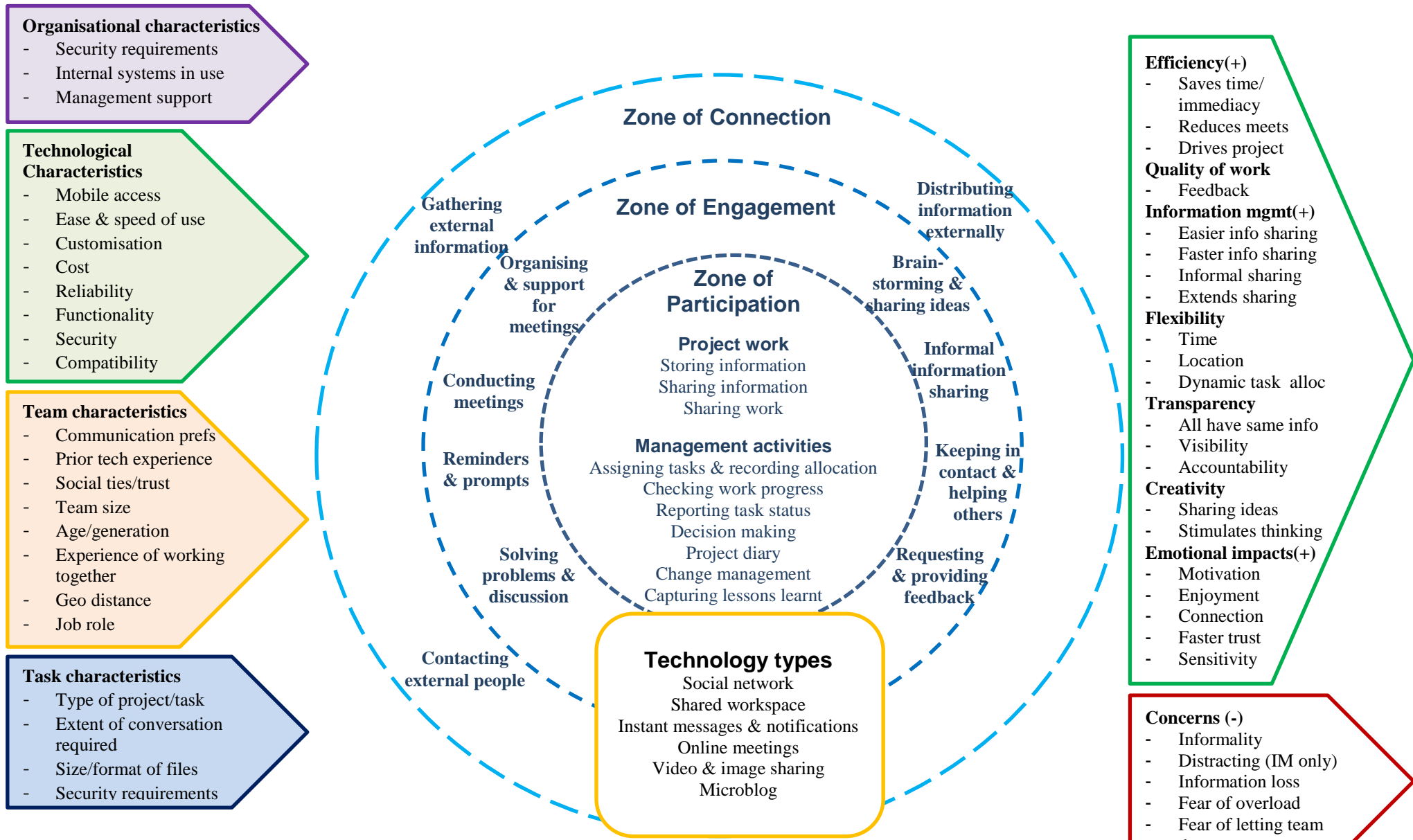


Fig 5.9 Consolidated findings for the interaction of social media with the practice of project management (duplicate)

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