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**Communication challenges of web development SMEs:
The benefit and challenges of organisational tensions**

**A thesis
submitted in fulfilment
of the requirements for the degree
of
Doctor of Philosophy in Marketing and Management
at
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by
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Abstract

This thesis examines the communicative constitution of organisations (CCO) through the communication challenges faced by web development small and medium enterprises (Cooren, Kuhn, Cornelissen, & Clark, 2011; Putnam & Nicotera, 2009). Using grounded theory method (GTM) (Charmaz, 2014; Glaser & Strauss, 1967), research was conducted in the Silicon Slopes, a high-tech industry pocket in Utah, in the United States of America. The data was collected by conducting 33 interviews in 26 web development firms. Ten of the firms were small firms as defined by the OECD (2005), and the remaining 16 were medium-sized organisations. Within the firms, several communication challenges emerged from the data in the form of entangled tensions.

Entangled tensions are imbricated dialectical tensions interwoven with knotted tensions (Sheep, Fairhurst, & Khazanchi, 2016), and were identified in this research through the use of GTM (Dey, 1999; Martin & Turner, 1986). Knotted tensions result from entanglements of organisational conflict related to innovation and the accompanying complexities of technology (Sheep et al., 2016, p. 4). Dialectical tensions result when two opposite interests simultaneously pull against each other (Putnam, 2015). Combining these two tension orientations assisted in understanding the process of constituting an organisation through communication practices (Kuhn & Schoeneborn, 2015). The primary entangled tensions presented in this research project are metacommunication tensions, ambidexterity, expectations, constrained creativity, and trust. In conjunction with the entangled tensions in these high-tech firms, the data also revealed strategies used by small- and medium-sized web development firms to reconcile the tensions.

Tension reconciliation in small and medium high-tech firms was a layered experience. Tension reconciliation strategies consisted of three approaches. The first approach involved incorporating soft skills training into the organisation. Soft skills comprise interpersonal communication (people) skills, such as listening, and conflict resolution among organisational members. The second approach involved encouraging the development of organisational literacy. Organisational literacy is the enactment of knowledge management in the organisation as the organisational members teach stakeholders how the web

development process occurs. The third approach involved working to simplify highly-technical languages and processes used in the firm for nontechnical stakeholders such as clients, organisational members in nontechnical roles, or investors.

The findings from this research investigation have several theoretical implications for those studying CCO and organisational tensions. First, I argue that entangled tensions are a new contribution to CCO and organisational tension theory development. Second, I claim that firm members reactively and proactively resolve organisational tensions. Reactive reconciliation occurs during a communication crisis while proactive tension resolutions occur during meetings or other formal organisational communication practices. Third, and finally, the practical implications of the research demonstrate that small and medium-web development firms should be proactive in their translation and improvement of web development literacy practices as these are critical management communication strategies.

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List of Abbreviations

BYU	Brigham Young University
CLBCA	Corporate Language-based Communication Avoidance
CCO	Communicative Constitution of Organisations
ICT	Information Communication Technology Sector
GTM	Grounded Theory Method
SME	Small and Medium Enterprises

Chapter One: Introduction

High technology (high-tech) organisations are in the business of innovation and creativity. Nestled within the high-tech industry are small and medium web development firms which create and maintain Internet content and websites. These small and medium-sized firms are prolific in the *information and communication technology* (ICT) industry. Yet, in the global market, they are among the ICT firms that are financially struggling and politically unsupported by policy, according to the Organisation for Economic Co-operation and Development (OECD) (OECD, 2015a). More than any other economic sector, ICT is 48% more likely to experience growth in new businesses each year. ICT companies are also a major source of employment in the United States (Hathaway, 2013). At a growth rate of 210% since the 1980s, it is young ICT firms that create most of the new jobs in the US (Hathaway, 2013), and to such an extent that the *digital economy*, or the Internet-based economy, is considered a new economy (OECD, 2015b).

Even with their impact on the economy, research on the communication practices of these firms is sparse. The first purpose of this research is to apply the concept of *communicative constitution of organisations* (CCO) to small and medium-sized web development firms in an effort to understand the specific communication challenges these firms' face (Kuhn & Schoeneborn, 2015). The second purpose of this research is to understand how communication practices affect small and medium-sized web development firms. To undertake the investigation of these matters required the combination of two qualitative research approaches. Grounded theory method (GTM) was employed to comprehend the nuanced challenges of web development firm practitioners (Glaser & Strauss, 1967); and CCO was used to connect the theoretical perspectives of organisational communication theory with the practical experience of the practitioners. Studying organisations from a CCO approach was a response to the call of organisational scholars to bridge the micro/macro divide of organisational research and to provide a new perspective on organisational theory development and research (Kuhn, 2012; Taylor, 2011). The use of the CCO approach also responds to the call for additional theory development in ICT from a *communicative perspective* (Leonardi, 2017; Tracy & Geist-Martin, 2014).

Organisational communication research is typically divided into themes (Cooren, Taylor, & Van Every, 2006; Kuhn, 2012). Research on communication in

web development firms parallels this trend. For example, García-Morales, Matías-Reche, and Verdú-Jover (2011) focused exclusively on day-to-day internal organisational communication by comparing it to innovation in the firm and organisational performance. Heavin and Adam (2012) argued that communication is central to knowledge management—the maintenance of information and processes as formal practices in a firm. Yet, they failed to acknowledge that knowledge management is fundamentally a communication process (Jensen, 1998). Considering knowledge management as communication practice would be assumed in the CCO literature. Studies such as these implicitly or explicitly state that communication is a phenomenon separate from the organisation.

Communicative constitution of organisations (Putnam & Nicotera, 2009) views communication and organising/organisations as intrinsically connected (Cooren, Kuhn, Cornelissen, & Clark, 2011; Kuhn, 2012; Schoeneborn et al., 2014) and argues that when these concepts are compartmentalised it jeopardises an enlightened perspective on the organising/organisational experience (Taylor, 2011). As Taylor (2011) argues, organisational communicational theory is not static. CCO takes a *holistic* view, as does the GTM approach, providing an opportunity for researchers to develop emerging theories (Dey, 1999; Leonardi, 2017). This all-in-compassing approach to research brings opportunities to consider communication and organisations in new ways.

An example of research that exploited this opportunity is Mayère's (2010) combined study of organisational communication with the ICT field. She argued that the communication issues in ICT firms are the result of change and new technology implementation. While her observations were robustly supported in the literature (for diverse examples see Leonardi & Barley, 2008; Taylor & Van Every, 2014; Wilhoit & Kisselburgh, 2015), she specifically makes the connection between ICT and communication. Mayère (2010) argued that a critical intersection occurs in organising and information, and it hinges on communication. Mayère's (2010) findings are significant and a catalyst for this research.

Rationale and Research Problem

In this section of the chapter, I outline the rationale for this study and the research problem.

Rationale. According to Mayère (2010) and Carvalho (2014), the precise intersection of communication and ICT needs additional research. In organisational communication, the ICT intersection is replete with literature about technological

implementation, social media usage, and computer-mediated communication within the organisation (for examples, see Albu & Etter, 2016; Humphreys & Wilken, 2015; Stephens, Chen, & Butler, 2016; Sun, Mollaoglu, Miller, & Manata, 2015). However, this research study takes a different approach. It looks at the communicative practices of web development firms and the tensions that require communicative actions to improve or maintain the organisation. Therefore, this thesis responds to Leonardi's (2017) call to re-examine organisational communication impact theories.

Instead of examining what happens when a major technological change occurs in an organisation, this research looks at the communication challenges affecting the functioning and success of firms that are bounded by technology. In other words, these firms would not exist if the technology did not exist. Another noteworthy difference of this thesis is the use of GTM with CCO, a seemingly counterintuitive pair. In short, the purpose of this research is to examine the daily communication challenges of web development firms' organisational members with the intent to explore CCO by empirically testing it against practitioner experiences.

Much like public relations firms or advertising agencies, web development firms are situated at an important intersection of identity communication. These firms are involved in creating their own organisational identity through branding and websites and are also involved in creating and branding other firms' organisational identities (Cheney & Christensen, 2001; Cheney, Christensen, & Dailey, 2013). This means these firms are uniquely suited for the examination of communicative events since they are replete with the need to communicate for themselves and for others. Also, studying web development firms provided insights into the communication challenges presented by firms that operate with a highly-specialised knowledge. In other words, it provides an opportunity to examine how individuals with highly technical knowledge communicate with those who do not share their knowledge or experience in the high-tech industry. Consequently, this study seeks to offer insights into organisational communication and technology that are different from the common research themes of technological *implementation* and technology *use* in organisations (Rice & Leonardi, 2014).

Another motivating rationale for this study are the calls for research into the extent to which, or not, CCO theory actually aligns with practitioners experience (Mills & Cooren, 2016). The CCO approach was hailed as a new phase in organisational communication theory development (Putnam & Nicotera, 2009;

Taylor, 2011), yet, its tenants are still developing. It draws on three distinct, though markedly different, philosophical approaches: the Montréal School, the Four Flows, and Luhmann's social systems theory (Cooren et al., 2011; Schoeneborn et al., 2014). All subscribe to the theoretical premise that organisational reality is communicatively constituted (Schoeneborn et al., 2014), yet their parallels wax and wane beyond that basic premise. Using a CCO framework with GTM to study web development firms allows a bottom-up (Urquhart, 2013) application of CCO. This approach should reveal how organisations are actively and latently communicated by those participating in communicative practices. It poses questions about which, if any, of the CCO philosophical approaches best align with practitioner experiences, and it contributes to the current discussion on mainstreaming and grounding communication as constitutional to organisational reality.

CCO can be mired with abstraction despite its profound insights into the organising/organisation process (Kuhn & Schoeneborn, 2015, p. 299). Since CCO research is mired in this abstraction, GTM was used in conjunction with CCO to provide a pragmatic approach to the research and one which would help me to *make sense* of the participants' experiences (Glaser & Strauss, 1967). From both theoretical and methodological perspectives, CCO reveals "tensions and dissensus [and the] decisions [that] tend to *drive* and perpetuate the organisation" (Kuhn & Schoeneborn, 2015, p. 298). This research is seeking to connect tensions to CCO by using GTM as the method allows the researcher to follow research leads important to the practitioners (Glaser & Strauss, 1967); therefore, the emerging data should revealed the constitution of organisations.

GTM supports organisational communication theory development and application because it allows us to examine the nuanced parts of communication events within the communication struggles involved in uncovering processes and systems (Glaser & Strauss, 1967). Since web development small and media enterprises (SMEs) function more like a public relations or marketing firm, they provide a condensed representation of communication events (Cooren, Kuhn, Cornelissen, & Clark, 2011). These firms also work on the fringes of technological development and, like their large corporate counterparts, change rapidly. In some cases, however, they defy historical patterns for organisational growth (Armbrust et al., 2010; Colombo & Grilli, 2010; Feitelson, Frachtenberg, & Beck, 2013). In other words, they sometimes grow shockingly fast, like Instagram (see Konrad, 2017, May 23 for other examples of fast-growing firms).

Weick (2006) argued that it is the responsibility of organisational communication researchers to understand the communication practices around technology use and development (p. 172). He encouraged research on topics in technology for several reasons. When reflecting on the random variability of technology and their innovative organisations, Weick (2006) suggested the consistent ambiguity of these organisations ought to appeal to the academic for purposeful clarification. He states that technological organisations and their products are “fascinating because of their complex equivocality” (p. 172). By this he means that high-tech firms have diverse impacts on communities and economies and their products are equally, if not more, impactful. As a result, it is the duty of academics to make sense of this impact. A prime example of this are social media platforms. The organisations behind these platforms are themselves fascinating and complex, but their products have completely altered society and the global economy. Also, Weick (2006) also suggested that to evaluate the central issues of these organisations, we need to understand the fundamental communication tensions that exist within and around them. An example of such a tension lies in developing an externally-oriented organisational culture (Büschgens, Bausch, & Balkin, 2013) while having a difficult time managing their organisational reputation (Abimbola & Vallaster, 2007). An example of this would be the share-riding company, Uber. Uber, as a social app, was exploding. Meanwhile, their internal culture was completely falling apart.

Through a grounded theory approach, this study sought to: a) evaluate the primary communication challenges of small and medium-sized web development firms; b) determine the transitional moments when communication practices become a priority; and, c) identify the communication practices used during the transitional moments of *high-priority* communication. To summarise, the purpose of this study is to explore the communication challenges and strategies of web development firms, contributing to the literature on high-tech SMEs, organisational communication tensions, and CCO theory development. Consequently, it is intended that the findings of this research will carry theoretical and practical implications.

Research Problem. The research problem addressed in this study had two prongs to it. First, there is a lack of literature in the organisational communication discipline on high-tech SMEs. The existing literature suggests that high-tech SMEs would function much like large high-tech firms. However, from the literature on

SMEs, it was evident that small and medium sized firms deal with *significantly different* challenges than larger firms. This contradiction was identified as a problem worthy of investigation because the majority of high-tech firms are SMEs, and according to the OECD (2015), they are the fastest growing industries in developed economies. Furthermore, little is known about the communication challenges that are specific to SMES. In short, the communication discipline knows almost nothing about the communication challenges faced by high-tech SMEs – a phenomenally significant sector in terms of potential for social and cultural impact, economic impact, and in terms of the sheers numbers of the workforce that are, and will be in the future, associated with these types of organisations.

The second research problem around which this study is focussed is the need to make empirical connections between CCO and practitioners. That is, this study asks: if there are communication problems in high-tech SMEs, could applying CCO, a theoretical framework, assist the practitioners to understand their communication challenges? In 2014, when I began this research, CCO was being used as a philosophical framework in organisational communication, but, as a purely abstract framework, CCO theory made no attempt to assist practitioners to improve communication in their organisations. Therefore, this research should be considered a response to Kuhn (2012) and Taylor (2011) and the need to bridge the divide between the organisational communication theory and the empirical experiences of the practitioners. In these terms this study can be described as applied CCO research, and situated within the context of the European Group for Organisational Studies (EGOS) subtheme which encourages the advancement of CCO research and publication. It is aligned with other recent CCO investigations such as that undertaken by Boivin, Brummans, and Barker (2017) wherein they evaluated trends in CCO research.

To summarise, I am arguing that it is possible we were missing a significant insight regarding high-tech SMEs and communication. As a result, the research problem is a question of the assumptions within the organisational communication discipline. That is, what communication problems do high-tech SMEs have that have not been addressed by the communication discipline and how can these insights be connected to CCO. Also, as I reveal in the next section, had personal motivations for undertaking this investigation.

Researcher Motivation

In addition to the rationale, it is recommended by GTM researchers that new researchers using the method should account for their *standpoints*, or research biases, in the early phases of their research projects (Bryant & Charmaz, 2011; Gibbs, 2015). As a socially constructed, qualitative method, the expectation is that the researcher's standpoints will influence the interpretation and framing of the data (Charmaz, 2014; Denzin & Lincoln, 2005, 2013). Therefore, it is only appropriate that I should, at this point, account for my motivations and interest in this research project. First, in 2008 during the economic crash, I watched my father's small business fail. While my father's business interests were in construction and manufacturing rather than in the high-tech field, his experience heightened my curiosity about SMEs, their viability, and their sustainability. Second, my bachelor's degree in political science emphasised the study of international relations and economic sustainability programs. This current research is a continuation of my early higher-education experiences and research interests. Third, my husband is a web developer. As he would come home from work, he would recount his frustration with matters related to working with business analysts and clients. I was curious about whether his experiences were peculiar to him, or common in the high-tech field and how we might make sense of these experiences in theoretical terms. Fourth, and finally, I have lived in Silicon Slopes, and I noticed the intense promotion and recruitment of high-tech firms by local governments and other interested stakeholders, such as the high-tech firms already established in the region.

Scope of the Study: Web Development SMEs

The scope of this study was to explore the organisational communication practices and challenges in small and medium web development firms. The intent of this research was to apply CCO to a whole organisation. This is a perspective that has not been taken prior to this study. In other words, I was using the tenants of CCO as an analytical tool along with GTM. To gather the data I needed for the research, the bulk of the interviews were conducted with small business owners in Utah in Silicon Slopes, one of the fastest growing ICT sectors in the United States (Utah Business, 2013, Nov 5). To expand the scope and for theoretical saturation (Glaser & Strauss, 1967), project managers were also interviewed. The project managers were in the Western United States in prominent high-tech cities: Los

Angeles, CA; San Francisco, CA; and Seattle, WA. Their experiences were found to precisely mirror the experiences of small business owners in Utah.

Practitioners were interviewed from twenty-four firms. Of the twenty-four firms, ten were small firms with ten employees or fewer. The other fourteen firms were medium-sized firms or teams of employees ranging from 11 to 50 in size. The experience of the practitioners interviewed ranged from two to twenty years. The organisational roles represented in the research were: small business owners, CIOs, project managers in medium-sized firms, HR representatives, technical writers, and developers. In total, I interviewed thirty-two people.

Limitations of the Scope

There are several limitations to the research. First, the research on small and medium web development firms provided a challenge as a subset of the ICT industry as the technology and the organisational roles are ever-evolving to keep up with changes in innovation. For example, a small firm may begin by building websites for their clients. But, as they grow, they may begin to offer other e-commerce services to support their clients and to increase revenue. While there is copious information on ICT SMEs generally, the research specific to web development SMEs from a communicative perspective is considerably small. Therefore, the literature available at the time was sparse.

A second limitation unique to this research project was the environments in which the small and medium firms operate; that is, large firms overshadowed these SMEs (OECD, 2015). Also, small and medium firms are supported by the products developed by large firms. In many ways, large web development firms, such as Google, directly affect the ways the small firms work. However, while they provide task management systems or web-based instant messaging options, the large firms do not dictate how small and medium firms use their communication tools. As a result, web development SMEs are dependent on large web development firms.

The third limitation to the scope of the research was difficulty in getting access to developers for interviews. As discussed in the findings, the small firm owners and project managers carefully guarded their developers. Their reason for gatekeeping the developers was twofold: first, they perceived developers as unable to communicate well; second, and more importantly, developers are the engine of the organisation. Therefore, taking time away from the developer was the equivalent of a financial loss to the web development firms.

Fourth, GTM is a nonlinear research experience, meaning, the coding phase and the data collection phases happened simultaneously. In this method, literature is constantly being reviewed in the development of the findings. This is the cyclical nature of GTM. Therefore, the literature review is presented by topic including the topics which were examined after the original literature review was completed.

Thesis Overview

I now turn to briefly outlining the nine chapters that make up this thesis. Following this introductory chapter, Chapter Two provides a contextual background explanation of the research for the reader. The background chapter includes information about web development firms and about the high-tech industry in Silicon Slopes where most of the research was conducted.

Following the background chapter is the literature review. A review of the existing relevant literature is undertaken to review the following topics: organisational communication, the three approaches to CCO, and the six CCO common premises. The literature review also explores materiality, sociomateriality, and organisational tensions. Also included is literature concerning sensemaking and sensegiving. The chapter concludes by reviewing literature at the intersection of ICT and organisational research minus the technology implementation literature. It is also important to note that the literature review occurred in two phases. The first phase was completed before data collection and, as is common with GTM, additional literature reviews were conducted throughout the coding phases (Charmaz, 2014). For the sake of parsimony, however, all literature was included in Chapter Three, the literature review, for the reader.

Chapter four outlines the methodology and method of the research project. It provides a brief history of GTM and discusses the role of interviews in this method. In addition to GTM history, Chapter Four also explains GTM terminology to establish a common language between the reader and the researcher. In this regard, the structure of the methodology chapter is as follows: the GTM terminology is presented and defined, and examples from this research project are provided to demonstrate how GTM was used. The chapter sections will read *GTM term* followed by a section titled *the GTM term applied to this study*. This pattern for presenting the methods section is one attempt to compensate for presenting a cyclical research process in a linear format. Also included is an accounting of the ethics approval process.

The organisational tensions chapters comprise Chapters Five and Six.

Chapter Five examines the context in which these findings exist. It describes the web development process, the common organisational structure of the web development firms, the significance of project management, and illustrates the predominate communication flow that occurred in the firms. Chapter Six introduces *entangled tensions*, a concept I developed out of this research. The discussion of entangled tensions is included in the findings chapters because it was a finding as well as a method through which the data was coded. It was a method because it was an analysis of the data wherein organisational tensions were compared and contrasted for relational connections. Additionally, Chapter Six contains the metacommunication tensions and an introduction to the conditions created by an organisation when a *lack of shared* meanings and language exist in a high-tech firm. Chapter Six is also devoted to the entangled tensions around trust. This chapter notes the significance of ambidexterity management strategies and the ways in which those strategies become an undercurrent for enabling entangled tensions. To conclude, Chapter Six highlights how trust, constrained creativity, and stereotyping all pull against the organisational members and clients, thereby affecting the whole organisation.

The next chapter, Chapter Seven, describes the practical and creative ways the practitioners lessen the conflict caused by entangled tensions. These strategies are called reconciliation strategies because of their proactive mitigation of the conflict. Translation and literacy were additional communication strategies which helped the firms ease the conflict tensions that result from not sharing a common language. Translation and web development literacy are likened to sensemaking (Weick, 2001) and sensegiving (Gioia & Chittipeddi, 1991). Also, in this chapter I introduce the new concept of organisational proprioception. Organisational proprioception represents an individual's sensitivity to the organisational system. Individuals possessing organisational proprioception understand how communicative practices directly impact the communication flow of the firm.

Chapter Eight focuses specifically on the strategies used to reconcile the tensions identified in chapters Five and Six by demonstrating how applying soft skills, or interpersonal communication skills, to difficult situations helps the organisation. It also outlines the translation and literacy process which emerged from the data.

In the concluding chapter, Chapter Nine, I answer the research questions by reviewing the findings and outline the significant contributions of the thesis. This chapter ends with a section for practitioners and a note on the opportunities for further research. This thesis also includes four appendices: a glossary, the interview questions, and details the GTM coding process for this project.

Chapter Two: Background

In the previous chapter, I discussed the rationale for studying web development firms from a communication perspective. In this chapter, I expound on where web development SMEs fit in the ICT industry. In this chapter I also define the terms ICT, software, web development, and SMEs. Then, the chapter describes the information and communication technology industry by explaining the status of the ICT economic subsector, according to the OECD (2015). Following a description of the subsectors and to further narrow the context, the American Utah ICT industry is discussed. As part of this, the following information will be provided: first, what makes Utah a tech hotspot. Second, information about SMEs in Utah will be provided to contextualise the value of SME research in the region. Third, other important contextual information is provided adding to the overall scope of the regional ICT industry. Before the regional applications are drawn, definitions of the industry are given.

Defining ICT, Software, Web development and SMEs

Defining ICT. ICT is an industry that provides services and products for businesses and individuals to enhance their communication needs. It does this by increasing their ability to store and retrieve information with the assistance of technological hardware, software, and other technological advancements. Rice and Leonardi (2014) state that ICT:

Generally, refers to the devices, applications, media, and associated hardware and software that receive and distribute, process and store, and derive and analyse digital information between people and machines (as information) or among people (as communication). In the organisational context, ICT refers to a broad range of computerbased digital systems from transaction and information processing to wired and wireless communication media, connected through an internal intranet or external Internet and wireless networks (p. 426).

Rice and Leonardi (2014) provide an overarching definition of ICT, and they explicitly drew connections between the industry and the discipline. In addition to drawing these connections, they also began to highlight the value of organisational communication studies within the ICT industry as they described the relational connections among the machines and people that comprise organisations.

To further delineate the definition provided by Rice and Leonardi (2014) for this research project, it was important to note the varying subsectors of ICT and where web development was situated within these subsectors. ICT is divided into

two basic categories: manufacturing and services. On the one hand, manufacturer ICT firms include organisations such as computer and hardware manufacturing, firms which create insulated wire and cable for information transmission, or mass media hardware such as manufacturing televisions, radios, and other associated equipment. On the other hand, the service sector of ICT include organisations such as telecommunications and computer-related activities (OECD, 2002). Computer related service activities may be split into networking, web development, software development, e-commerce, graphic design, and Internet service providers, among others (OECD, 2002).

ICT sector status. The ICT sector, specifically the service sectors, is a knowledge-based industry that has profound effects on the global economy (OECD, 2015). Knowledge-based, capital economies are dependent on “software development, design, and human capital” (OECD, 2015, p. 17). In 2015, research and development funding alone in the ICT industry reached about 1.1 trillion USD in the global economy (OECD, 2015), indicating the industry size. These numbers illustrate the hypercompetitive market within which web development SMEs compete. Also, these fiscal numbers demonstrate the financial and human resources which comprise the industry.

The ICT industry is forecast to grow significantly. For example, employment in the ICT industry was expected to grow at a rate of 12% from 2014 to 2024 which is faster than the average for all occupational subsectors of the United States economy (United States Department of Labor, 2015a). Software development is expected to have a 17% growth, and employment in web development firms is predicted to increase at an even greater rate with an anticipated growth of 27% due to programming demands for mobile devices and e-commerce (United States Department of Labor, 2015b; 2015c). This growth for web development is tied to the crucial - though under researched - contribution it makes to organisational communication and identity (for examples, see Bosch, Elving, & De Jong, 2006; Larsen & Pedersen, 2016).

Defining software and web development. Computer-related services have niche roles and are defined by their function within the larger ICT industry. For this study, I defined only two of the computer-related services: web development and software development. The reason for defining these two services was because all computer-related service activities contain components of web or software development. A smartphone is little more than a paperweight made of glass and

metal when the software is removed. Therefore, software and web development are foundational for the ICT industry.

Since software and web development are critical to ICT, they are defined as follows: *web development* is the process of programming websites and functions to be used on the World Wide Web (Scharl, 2012). Similarly, yet in contrast, *software development* is the process of coding programs for use on high-tech hardware, such as laptops, and *may or may not* be used in conjunction with the Internet (United States Department of Labor, 2015b). In defining software development, web development, and the ICT industry, it is also useful to consider the history of web development and how it has merged with software development.

A brief history of web development. The history of software development coincides with the history of computer hardware (Duque, Collins, Abbate, Azambuja, & Snaprud, 2007). Web development and web development firms are a recent addition to the software history. Web development history directly connected to the history of hypertext, or early computer programming languages (Scharl, 2012).

In the late 1960s and 1970s, in the United States, advances were made in a system which enabled computers, not in the same room and sometimes across the country, to connect. This was called the Advanced Research Projects Agency Network (ARPANET). ARPANET was the earliest version of the Internet and was managed by the United States government. Eventually, this network of connections became known as the Internet. The Internet became accessible to everyone through interconnected web pages, thereby creating the World Wide Web. In the 1980s, the rudimentary Internet was refined and established throughout developed economies. In the 1990s, the World Wide Web explosion saw the beginning of the prolific use of the Internet in businesses and schools. The Internet allowed access to websites and other information beneficial in both business and educational contexts (Scharl, 2012).

It was during the late 1990s that *web development firms* emerged. With the emergence of the web development firm came the need for web development skills (see Marken, 1998 for a historical account of the need for web development skills among public relations professionals). From this point in history to the present day, the need for specialised web development knowledge has increased exponentially.

Contextualising High-Tech SMEs

Web development firms come in many sizes; this research focused on web development SMEs. In the United States, the common term for small and medium sized firms, such as the ones participating in this study, is *small businesses*.

However, *small business* has several undefined connotations and does not adequately represent the high-tech firms or communication challenges represented by this research. Therefore, to standardise the definitions of the firm sizes, the OECD (2005) definitions were used.

The OECD defines small firms with 50 employees or less. Medium firms are 50 to 249 employees, and large firms are 249 employees or larger. Hence, small and medium-sized firms may have more than 10 employees (10 or fewer are microenterprises), but less than 249 employees. Table one presents this definition in an accessible format for the reader.

Table 1: OECD Firm Sizes

OECD firm sizes

Small	50 employees or less
Medium	50-249 employees
Large	249 employees or more

Size is the first defining category of SMEs. But, understanding the basic characteristics of high-tech SMEs adds substance to the insights of the research contributions from this project. For this research, it is critical to note that *high-tech small and medium firms are distinctly different in their characteristics from SMEs in other industries*. “It is well established that SMEs differ from larger firms by way of available resources such as human and financial capital, management experience, and organisational procedures” (Chang & Hughes, 2012, p. 2). In addition, high-tech SMEs adapt quickly to high-velocity environments and have notable innovation output (Bernroider, 2002; Nunes et al., 2013). Because their size, these organisations have distinct management styles, organisational structures, reactions to the environment, and niche markets to which they contribute. Furthermore, they face greater organisational tensions than large, well-established firms (Chang & Hughes, 2012).

How long an SME has existed also affects its function and organisational goals, as well as determining the structure, constraints, and tensions it experiences. There is no research evaluating how age effects SME communication. “Age is of greater relative importance for the survival of young SMEs than the survival of old SMEs” (Nunes, Gonçalves, & Serrasqueiro, 2011, p. 265). On the one hand, young firms have the challenge of developing to the point of efficiency. On the other hand, older firms have a developed equilibrium; that is, they have developed strategies to manage the mess of their organisational tensions, particularly the constraints and tensions required for survival. They understand that the intensity of their focus needs to be on innovation.

Other elements of the SME experience are governed by the financial resources available to the organisation. High-tech small and medium-sized firms also have a different set of financial needs than general SMEs (Nunes et al., 2013). “Venture capital is an important source of funding, especially for young technology based-firms” (OECD, 2013). Whether it is venture capital or business loans, these organisations also need to develop a consistent cash-flow (Nunes et al., 2013). Access to funding in high-tech SMEs largely determines the success or failure of the organisation. It has been noted that the SME CEO’s reputation directly effects funding access (Colombo & Grilli, 2010). Funding also influences the firm’s culture (Alvesson, 1993; Vaughn, 1988).

Table 2. Summary of Small and Medium Enterprise Differences

Summary of Small and Medium Enterprise Differences

Defining Features	General SMEs	High-tech SMEs
Size	10-250 employees (OECD, 2005)	10-250 employees (OECD, 2005)
Specialization	Beyond size, the characteristics and specialisations are so diverse it is difficult to generalise (Scarborough, 2011).	Any specialisation dealing with technological developments: e.g., energy, artificial intelligence, biotechnology, nontechnology, information technology, robotics, telecommunication (OECD, 2002)
Organisational Growth potential	Varies; depending on industry, sector and current market status (Hatten, 2012)	High (OECD, 2013)
Unique Financial Needs	None	Venture Capital (Nunes et al., 2013)
Market focus (local, regional, or international)	Local, regional and international; depending on industry, sector and current market conditions (Hatten, 2012)	Initially, local or regional; Increasing numbers beginning with an international focus (Cannone & Ughetto, 2014; Lopez, Kundu, & Ciravegna, 2009)
Competitive Advantage	Flexibility and customer service (Hatten, 2012)	Innovation and knowledge management (Dalkir, 2013)
Ability to generate employment	Varies; depending on industry, sector and current market status (Hatten, 2012)	High (OECD, 2013)
Scalability	Variable (Hatten, 2012)	High (Ubeda et al., 2013)

In Table Two, below, a summary of generalised and high-tech SMEs is provided. I define a generalised SME in broad terms; that is, a small or medium business that focuses on any type of product or service. The first column of the table lists the categories or basic features of SMEs. The second column describes the defining features of high-tech SMEs as compared to general SMEs. The third column provides the contrasting characteristics of high-tech SMEs, thereby demonstrating—in simple table format—how high-tech SMEs are different from general SMEs.

As indicated by Nunes, et al. (2013), high-tech SMEs have high financial needs with different requirements than general SMEs. Their high financial needs, their needs for government support, and their needs for an established Internet infrastructure are all consequences of the hypercompetitive market in which they operate. Given the influence of large high-tech enterprises (OECD, 2015), this is not an easy business path.

To summarise, high-tech SMEs function with different constraints and opportunities than traditional SMEs. As a brief reminder, SMEs in this research are defined using the OECD definition with the focus on organisations that have 10-249 employees. The high-tech firms that are the focus of this research are situated within the service sector of ICT, specifically in the web and software development services. In the Utah ICT economic sector, SMEs play an equally important role and retain the unique characteristics common to the OECD-defined ICT industry. While there are general forecasts about how web development contributes to the future of the US economy, there are specific geographic niche *hotspots* of technological development in the country where software and web development have a considerable influence in the regional service industries. Having defined ICT, software development, web development and SMEs, in the next section I outline where Utah, as a regional tech hotspot is situated within the larger global ICT industry.

Utah, USA, a Tech Hotspot

Utah is a state located in the Western United States and has a population of three million, predominately Caucasian individuals. The average age in the state is 30 years-old with 69% of the population older than the age of 18. Most Utah households are considered middle class with the average household income of USD 60,000. Ninety-one percent of the population finish high school; yet, only 31% complete higher degrees (U.S. Census, 2015). Also worth noting is that 50 percent

or more of the population belongs to the Church of Jesus Christ of Latter-day Saints, or the Mormon Church (Canham, 2017, July 16). Historically, construction and retail have been the primary industries driving Utah's economic development. However, in a 2012 report on the Utah economy, professional, scientific, and technical services superseded construction and retail (State of Utah, 2017; United States Census Bureau, 2017) – indicative of the growth of the high-tech hotspot that now comprises the ICT industry in Utah.

Technology hotspots are locations with specific characteristics that support innovation. Firstly, technology hotspots are geographic locations where *the local or regional economy supports high-tech firms*. Secondly, technology hotspots provide technological maintenance; that is, one of their purposes is to *maintain already existing high-tech products* through, among other things, software development, Internet-based maintenance, or by maintaining and building computing hardware. In addition to maintaining technology that already exists, *hotspots also develop new technologies*. For example, a local high-tech company developed prominent word processing PC software. As the company maintained the word processing software, they also developed a spreadsheet software to be paired with it. In addition to innovating new technologies, as the example demonstrates, a *hotspot requires local social resources such as educational intuitions*, like universities, which assist in nurturing innovation (OECD, 2015). An example of a technology hotspot is Silicon Valley in California, United States. Silicon Valley has universities, such as Stanford and the University of California, Berkley, and local resources, like venture capitalist firms and local government support which combine to support the growth of the industry.

Within the United States' economy, other technology hotspots have evolved similarly to Silicon Valley. One of these is *Silicon Slopes* in Utah ("Busy Bees," 2013). Silicon Slopes is branded to mirror Silicon Valley in California. The photo in Figure 1 below illustrates this branding.

Figure 1. Silicon Slopes



Figure 1 is a billboard along the interstate of I-15 near Lehi, Utah. Lehi, UT is the middle of Silicon Slopes. The purpose for including this photo is to demonstrate the proactive attempts to brand the region.

Silicon Slopes has the characteristics of a technology hotspot. There is adequate funding for high-tech start-up development (venture capitalism and bootstrapping); government support (Utah Technology Counsel and Technology Commercialisation and Innovation Programme); institutions of higher education willing to assist in innovative practices (Brigham Young University and University of Utah); and the high-tech infrastructure needed for innovation (Google Fiber). The 2015 *Brookings Institute* metropolitan policy report (Muro, Rothwell, Andes, Fikri, & Kulkarni, 2015) noted the significance of Utah's technology sector and how it meets these requirements.

High-tech financing in Utah is abundant. The state consistently rates among the top seven states in the United States to raise large amounts of venture capital from investors for high-tech start-ups, and consistently raises more venture capital than the state of New York which economy thrives off of New York City (Steimle, 2015). According to Muro et al. (2015), Utah's high-tech sector is unique due to the regionally-specific investors and its comprehensive knowledge-based industry sector (p. 33, 78). In other words, regionally-specific investors are keenly interested in growing Utah's economy and are not investing in other prominent hotspots. Venture capitalist firms are created with the specific intent to financially support new or developing high-tech firms (Colombo, Luukkonen, Mustar, & Wright, 2010). These investors consist of venture capitalist firms such as Sorensen Capital, Pelion Venture Partners, and InnoVentures Capital Partners. However, it is not only local investors who are interested in growing Utah's high-tech industry. Venture capitalists headquartered in other locations in the United States also have branches

in Utah. Also, the State of Utah provides investment money to high-tech organisations for growth through the Technology Commercialisation and Innovation Programme (Utah Office of Economic Development, 2016).

Equally important to the abundant financing programs available to Utah SMEs is the use of a high-tech-business-growing strategy called *bootstrapping*. Bootstrapping is a slang term for a conservative financial approach to business building, typically in the high-tech industry; and influenced by local Utah culture (Christiansen, 2011; Christiansen & Porter, 2010). To build a business using bootstrapping, an entrepreneur starts with a small amount of their own money and then reinvests the capital back into their organisation (Christiansen, 2011). For example, an individual may decide to start building websites while working another full-time job. Any profit the person makes from the web development side-business is reinvested into the small web development firm until the individual is making enough revenue to quit their full-time job and hire others to work for him/her. This approach to business building can be divisive because of the slow growth caused by the restricted use of resources (Tam, 2015).

Some journalists reporting on Silicon Slopes suggest that the bootstrapping values of frugality may not be the best way to grow a business. They argue that growing businesses with venture capital may be more profitable (Nunes et al., 2011; Tam, 2015); however, the local culture can be financially conservative, particularly among SMEs. Ultimately, there are two general strategies with high-tech SMEs in Utah: 1) using venture capitalism, or 2) bootstrapping. As appealing as bootstrapping may be, venture capitalists primarily support Utah's high-tech industry. However, being financially independent is part of the local Mormon culture. Moreover, as Benedict (2012) argues, bootstrapping is one way in which Mormon culture influences business practices.

Mormons, or members of the Church of Jesus Christ of Latter-day Saints have a peculiar way of doing business and achieving success (Benedict, 2012) – one which incorporates their culture and religious beliefs into businesses practices (James, 2005, 2007). For example, James (2005) noted that the LDS culture permeates the software industry and their business in ways such as not working on Sundays or in business networking through *instant trust* because of shared religious values (p. 1210). James (2007) later wrote that understanding the high-tech hotspot in Utah reflects the way LDS social networks function. It also demonstrates the value of religious-based business relationships since the Mormon culture focuses on

self-reliance and independence (Stark, 2001). The LDS cultural norms around education, trust, networking, and frugality—to name a few—affect the way Mormons engage in business. James (2005, 2007) argued this was evident in the Silicon Slopes region where the LDS religion has predominate cultural influence.

Beyond private financial support in Utah, local government policy also supports high-tech growth. Utah is primarily a knowledge-based capital economy influenced by small business opportunities and policy (Muro et al., 2015; Utah Business, 2016). For example, the Technology Commercialisation and Innovation Programme (TCIP) (Utah Office of Economic Development, 2016) offers high-tech companies and start-ups money for innovation and investment. Programmes, such as TCIP, are historically significant in the region. In 1988, the Utah Information Technology Association (UITA) was created as a task force to establish a stronger ICT industry. The UITA later became the Utah Technology Council (UTC). The UTC provides a social network for all technology companies to connect and act as a lobbying voice for technology in local education programs (Utah Technology Council, 2016).

While simultaneously focused on education, UTC focuses on the industry itself—for example, supporting companies such as Novell. Novell, now Micro Focus International, was the first information systems corporation in the region (Vara, 2015). Novell and WordPerfect were seeds for the future thriving technology industry in Utah (Zaleski, 2016). Since the beginning of Novell in 1979, the technology and web development industry has changed dramatically (Zaleski, 2016). Large, multinational businesses, for example, eBay, Dell E.M.C., Adobe, and Qualtrics, now have offices or headquarters in Utah. However, significantly, there are small companies scattered among the large, multi-billion dollar (USD) businesses, and UTC is designed to support them as well. UTC is not only focused on the development of Utah's high-tech industry, it is also focused on a culture of computing and technology education.

The purpose of focusing on educational technology, as Vara (2015) argues, was to keep the local industry strong by exposing children to knowledge-based careers, such as software development, early in their educational experiences. UTC operated under the assumption that teaching children technology would support the local economy as they graduate from university and transition into the workforce. UTC's educational initiatives became imperative because there is a software development talent-shortage in the region (Peterson, 2013). The policy support and

state-funded organisations are additional pieces of the Silicon Slopes success. In addition to the educational programs mentioned here, Utah has institutions of higher education focused on supporting high-tech development.

The surge of software development companies in Utah had two influences: the Mormon church with its cultural propensity toward entrepreneurship (Benedict, 2012; Vara, 2015; Zaleski, 2016) and the local universities, most notably Brigham Young University and the University of Utah (Lev-Ram, 2016). Both Universities graduate large numbers of science and engineering students (Vara, 2015). While the University of Utah's emphasis is on biotech start-ups, Brigham Young University's emphasis is on software- or platforms-as-service start-ups (Vara, 2015). The impact of these universities on the local ICT industry is profound.

In addition to the influence of the universities, the State of Utah and specifically the region called the Wasatch Front, or Silicon Slopes, have created policies and infrastructure to support the high-tech industry. This infrastructure is the final characteristic of an ICT hotspot. The Internet infrastructure in the region is critical to the success of the high-tech industry (Zaleski, 2016). To support web development growth, Google developed Google Fiber, an ultrahigh speed Internet access service. Only eight cities in the United States have such access to Google Fiber. Salt Lake City, Utah and Provo, Utah, are two of the eight cities (Google Fiber Expansion Plans, n.d., illustration). Google Fiber is significant in its ability to traffic large amounts of data for a reasonable price (Gustin, 2013), making it a perfect infrastructure for Internet-based services such as web development firms.

To summarise, Silicon Slopes has four circuitual components that made it a technology hotspot. First, Google Fiber and other hardware create an Internet infrastructure with the ability to host companies with large amounts of Internet traffic. Second, the area is the home to two technologically influential universities that contribute to high-tech innovation. Third, the State of Utah supports policy and funds committees to help the high-tech industry grow in the region as well as educate children to keep them in the state and to eventually fill high-need jobs. Fourth, the region has consistent financial support from venture capitalists and a unique propensity to bootstrapping. Due to the diversity and continually growing impact of the technology industry in Utah, the Wasatch Front was rebranded as Silicon Slopes with the intent to rival Silicon Valley in California (Burke, 2016; Zaleski, 2016).

High-tech SMEs in Utah

Silicon Slopes has become the top location for start-ups and small technology business in Utah (Zaleski, 2016). It is worth noting that Utah's 105.7 billion GDP USD is dependent on the success of small and medium enterprises with a special emphasis on the high-tech industry and Silicon Slopes. Since high-tech SMEs are critical to Utah's economy, an unusual industry culture has emerged. As implied by the OECD (2015), high-tech SMEs are different in their development and culture as a subset of the ICT industry.

Zaleski (2016) writes, "The United States Chamber of Commerce recently ranked Utah No. 1 in innovation and entrepreneurship, No. 2 in high-tech performance and No. 3 in economic performance in a study of all 50 states" (para. 5; United States Chamber Foundation, 2015). The United States Chamber of Commerce (2015) also ranks Utah as first in high-tech job growth. Interwoven with the influence of the booming Utah technology industry is web development SMEs that contribute to the ICT growth in the area, but these contributions are understated in the research or the news coverage of Silicon Slopes.

Among the entire ICT industry in Utah, 17.1 % are software publishers (including online software development), and 25,000 small and medium-sized companies offer software services such as web development (Utah Business, 2016). Notably, between 2014 and 2015—the most recent comprehensive data— there was a 78.9 % increase in job openings for the technology sector (CompTIA, 2016). Small high-tech firms also affect this growth. Utah ranked in the top five places in the United States for starting a small business by the Kauffman Foundation (Marich, 2013), a foundation focusing on entrepreneurial development. The Small Business and Entrepreneurial Council anticipated consistent growth in Utah for small businesses at 3.3 % (SBE Council, 2016, Aug 10). These numbers reflected the strength and evolution of the technology region in Silicon Slopes for small and medium high-tech firms. They also indicate the rate of growth for software and web development firms and their influence on the regional economy.

Software and Web Development in Utah, a Brief History

Silicon Slopes (Burke, 2016; see Silicon Slopes Summit, 2017 for additional information) rebranded the Wasatch Front for credibility purposes and economic growth. Now, it rivals Silicon Valley more than expected (Zaleski, 2016). The anticipated growth and influence of Silicon Slopes was noted by the *Brookings Institute* (Fikri & Muro, 2015). Of the top fifteen growing and significant high-tech

cities in the United States, three are based in the Silicon Slopes region (Muro et al., 2015). Muro, the Brookings Institute lead researcher, said, “You think [the Utah cities and their companies are] going to be fairly corn-pone [or insignificant] stuff, and then you realize . . . these are significant companies,” (Vara, 2015, para. 3) that comprise 7% of the economic sector of Utah (CompTIA, 2016).

Despite their influence, these firms still face challenges, as CEOs and entrepreneurs in Silicon Slopes have identified. Utah’s evolving high-tech industry needs: 1) to connect with and retain talent; 2) to connect with educated investors (beyond the regionally specific venture capitalists); and, 3) to seek better strategies for communicating with policymakers (Canary, 2010; Peterson, 2013). While each of these challenges has an undertone of communication needs and skills, none of the CEOs or entrepreneurs specifically identified communication skills—such as strategic communications—as being some of their greatest needs. Communication needs and skills are overlooked in high-tech SMEs; and, if they are considered, it is usually in the context of managing information (Heavin & Adam, 2013; Kukko, 2013).

Contextual Research Justification

The reasons for researching Silicon Slopes were: first, Silicon Slopes meets the required criteria for a thriving high-tech economy, and organisational communication and high-tech hotspots need a stronger presence in the literature. Second, Silicon Slopes has a growing influence in the United States ICT industry (Vara, 2015; Zaleski, 2016); therefore, understanding how organisational communication practices present in a growing and influential technology hotspot may provide insights into other regions with similar growth patterns. Third, there is little empirical evidence of how the communication challenges and practices of web development SMEs in this region are influenced by intentional resource constraints like bootstrapping (Christiansen, 2011; Christiansen & Porter, 2010; James, 2005, 2007). Fourth and finally, the increased need for web development labour indicates growth in the industry. With the growth in the industry, research to assist web development firms and their communication needs could support firm viability.

Conclusion

In this chapter and for the reader’s contextual understanding, I reviewed the status of the ICT industry in the state of Utah, the definitions of SMEs and high-tech SMEs, and the context of the ICT industry. SMEs are small and medium-sized firms which comprise a large portion of the world’s ICT industry (OECD 2005,

2015a). SMEs were chosen as the definitional framework since small business in the United States connotes a variety of meanings. While there is a specific definition for small businesses in the United States (U.S. Small Business Administration, 2016), the SME definition better aligned with the research aims.

Also included in this chapter was a description of the geographic location, Silicon Slopes, a technology hotspot, where the research occurred. Further, I highlighted the unique opportunities presented for ICT in Utah by the cultural environment through local governmental policies, such as the technology commercialisation and innovation programme (TCIP), and the Utah Technology Council (UTC). It was noted there are adequate financing options for small high-tech firms in Utah which contrasts with other areas where small high-tech firms are known to struggle (OECD, 2015b). This chapter also highlighted the Mormon influence and the propensity for high-tech SMEs in this area to use bootstrapping. Furthermore, a brief description of Brigham Young University and the University of Utah was given and their influence in innovation development. The background chapter also provided some contextual justifications why research in this industry and this region is worthwhile.

Chapter Three: Literature Review

This chapter reviews the literature relevant to this research study. The purpose of a literature review is to assist a researcher in generating ideas and in developing questions for expanding the current literature. Also, it helps to avoid unintentionally replicating research by “enabling [researchers] to build on what others have done” (Zorn & Campbell, 2006, p. 173). Conducting a literature review supports the research project by demonstrating the value of the project within the realms of the current research and within the framework of the discipline’s current theories. While this chapter meets all of these criteria, it should be noted that the literature review as is presented here deviates from the how grounded theory traditionally expects literature to be drawn on (Glaser, 1992; Glaser & Strauss, 1967).

In response to the strong positivist position in research in the 1960s, Glaser and Strauss (1967) recommended that the academic literature review occur *after* the data had been collected and coded. This approach seriously deviated from the research norms of the time. However, current grounded theory researchers acknowledge the need for a literature review earlier in the research process (Charmaz, 2014; Corbin & Strauss, 2014) given the reasons presented by Zorn and Campbell (2006). As a result, this literature review was developed during two separate phases. The first phase involved reading the research *before* the data collection phase. The second phase of the literature review occurred *during* the data analysis (Charmaz, 2014) as recommended by grounded theory method. Therefore, it must be noted that the literature presented here did not provide a pre-emptive framework for the data analysis. Instead, reviewing the literature was an ongoing process. For the sake of clarity, however, and in acknowledgment of the traditional conventions and expectations of a doctoral theses, as well as recognising that some grounded theory research (Charmaz, 2014, Corbin & Strauss, 2014, 2009) is sympathetic to this structure, the literature review is presented first.

In this chapter, I discuss six bodies of literature. The first pertains to the history and definition of organisational communication. After defining organisational communication, I provide a brief history of the discipline and its intersection with qualitative research. The second body of literature I review is the communicative constitution of organisations (CCO) in terms of its history and its approaches. CCO is the central theory used in connection to this research and is outlined in detail. The third encompasses specific organisational communication

topics that emerged during the research process. The fourth covers relevant research on technology and organisations. The fifth relates to the research context such as topics on high-tech firms—from an organisational communication perspective—in rhetoric, management, project management, and networks. The sixth, and last, body of literature reviews the history of organisational tensions and provides examples of tension studies in high-tech firms. It begins with the intersection of literature in that defines organisational communication as it relates to web development firms or ICT firms.

Organisational Communication

In this section of the literature review, the definition of the organisation is established, followed by a brief history of the organisational communication discipline. It concludes with a definition of organisational communication.

Defining organisation. *Organisation* is defined from a myriad of perspectives for a multitude of purposes. For this research, *organisation* is defined in two ways: as a noun and as a verb. Traditionally, the connotation of an organisation was a noun. As a noun, an organisation may be defined as a group of people working together to achieve a shared goal. This conceptualisation of an organisation emerged from the Industrial Revolution (Jablin & Putnam, 2001; Putnam & Mumby, 2014; Taylor & van Every, 2011). However, as the study of organisations increased, the importance of communicative practices were noted, and the concept of an organisation as a verb began to emerge.

Organisation as a verb was connected to the central communication plays in the organisational experience. In Charles Barnard's (1968) 30th anniversary issue of his 1938 work, he recalled foreseeing the importance of communication in future organisational theory. He stated: “In an exhaustive theory of organisation, communication would occupy a central place, because the structure, extensiveness, and scope of organisations are almost entirely determined by communication techniques” (p. 91). Barnard (1968) explained that *organisation* is both a noun *and* a verb.

Considering organisation as both a noun and verb added depth to organisational studies. Taylor and Van Every (2011) describe the depth when they wrote that an organisation “becomes [the product of] that which stitches the conversations together . . . to produce a constellation of people, technologies, and practices that stretches over and links, a diversity of conversations” (p. 2). To further examine the dual connotations of an organisation, Barnard's (1968)

transformational conclusions on organisations and communication is worth closer examination. He wrote of the structure and scope of organisations from the traditional conceptualisation of an organisation. However, in his seminal explanation of the organisation, he noted that organisations consistently comprise both communicative issues and practices. Therefore, Barnard (1968) implies that organisation is a verb—an act of communication—as much as a noun. Anchoring on work like Barnard's, and descriptions like Taylor and van Every (2011), Weick (1979, 1995, 2012) argued that communication *enables* the purposes for which organisations exist; that is, to achieve a shared goal.

Organisational communication: history and definition. The history of organisational communication as a discipline is intertwined with the definition of organisational communication. Also, the nuances of the discipline's history contribute to additional insights into research trends and contexts in organisational communication.

Organisational communication history. Formal organisations and their role in modern society began taking shape in the 1880s in the United States and worldwide. In an 1886 tax dispute, the U.S. Supreme Court recognised Southern Pacific Railroad as a personage and granted the corporation the same rights and privileges as an individual using the 14th amendment to the U.S. Constitution as precedence (Santa Clara County v. Southern Pacific Railroad Company, 1886). The United States-based ruling quickly translated into similar rulings across Europe and the rest of the world (Taylor & van Every, 2011), and the conceptualisation of *organisation* significantly changed. No longer was an organisation a tool, like a hammer, it was a *living* system with its own identity. Furthermore, it also contributed to the cultural connotation that organisational identity supersedes the identities of the individuals which comprise the organisation. These definitions of organisations continued from the 1880 to the 1930s. These connotations perfectly supported the idea that an organisation was a machine concerned with maximising organisational production.

Max Weber (1922), a German sociologist, believed the key to a modern, well-functioning society was a strong, powerful, bureaucratic organisation that functioned like a machine (Naim, 2013) and that was governed by law and rules (Taylor & Van Every, 2011). Weber's theory of organisation paralleled Frederick Taylor's (1911) *Principles of Scientific Management*. Taylor's (1911) metaphor, the organisation-as-a-machine, outlined the best practices of the time for organisational

structure, leadership, co-worker relationships, and employee relations (Miller, 2014; Taylor & Van Every, 2011). French engineer, Henri Fayol (1925) took a similar approach: organisations should manage as a chain-of-command, similar to the military. Weber (1922), Taylor (1911) and Fayol (1925) each suggested that organisations functioned like a machine and people were the cogs that kept the machine running (Taylor & Van Every, 2011).

The organisational machine model emphasised order, rules, and structure—the highly-favoured, capitalist labour-exchange that reflected the cultural values of the time (Naim, 2013). Yet, the machine model dehumanised the labourers working within the organisation. Later organisational theorists would be highly critical of these early management theories (Ashcraft & Prasad, 2012; Miller, 2014). Taylor and Van Every (2011) argue that in all early theories of organisation, communication was often overlooked by management and organisational scholars. Communication practices themselves were simplified to fit within the perfect, mechanical flow. Instead of perceiving communication as the process to achieve organisational goals or objectives, communication was an ancillary management strategy.

By the 1930s, the concepts of the organisational machine model—maximum efficiency and effectiveness—were widely accepted theories (Taylor & van Every, 2011). However, in 1939, when Roethlisberger and Dickson conducted the Hawthorne Studies, the theory of the organisation-as-a-machine was undermined as the organisational metaphor moved from a machine to a social system (Miller, 2014). Mary Parker Follett (1941) and Chester Barnard (1938) emphasised the importance of communication in the field of organisational studies (Ashcraft & Prasad, 2012; Taylor & Van Every, 2011). For Follett (1941) and Barnard (1938), their personal experiences accentuated their interest in the individuals comprising the organisations. Barnard's experience as a representative for telephone companies led to his observations about leadership. He was convinced that leaders must connect to their employees on a more intimate level than cogs-in-a-machine (Wolf, 1973). Follett came to organisation studies from a different route. Her interest in humanising the individual in the organisation was a result of her studies in political science and ability to empathise with the plight of those in the organisation who were being *managed* (Graham, 1995).

To further argue against the organisational machine model, Blau (1956), under the mentorship of Merton (1957), documented the secret ways in which

individuals would undermine bureaucratic organisations. Significantly, Merton (1957) and Blau (1956) also argue that people in organisations were not mindless machines themselves (Taylor & Van Every, 2011). Merton (1957) and Blau (1956) followed work that was published twenty years earlier by Mayo (1933). Mayo (1933) identified the social problems caused by the organisation-as-a-machine model and advocated a human-centred approach to organisational studies which addressed the social needs of individuals in industrialised settings. Although organisational communication was present during this research period, it was not a central theme of study (Taylor & Van Every, 2011). For example, in Wolf's (1973) conversations with Barnard, Barnard explained his regret that his book, *The Functions of the Executive*, was too focused on authority. However, in his later years, Barnard mentioned little about his bold statements concerning organisational communication and leadership. Ashcraft and Prasad (2012) write of this time, "communication enjoy[ed] a strong if silent presence in the historical organisational studies literature" (p. 383).

The field of organisational communication studies began emerging in the 1960s within the United States (Taylor & Van Every, 2011) through the seminal work of Tompkins (Tompkins & Wanca-Thibault, 2001). Its evolution as a discipline borrowed from management theories in social psychology and sociology (Ashcraft & Prasad, 2012). Early organisational communication theorists argued that a fundamental focus was missing from the sociology, social psychology, and management theories - that of communication (Taylor & Van Every, 2011). Redding (1985) explained that the consensus among organisational and management scholars was that communication impacted the organisation; yet, *how* it impacted the organisation was not a question of inquiry.

In the 1960s and 1970s, the *how* and *why* of organisational communication began to emerge and form a new discipline developed from multiple perspectives with social psychology at the forefront of investigative work (Taylor & Van Every, 2011; see Weick, 1979). An example of these changes is illustrated by tracking the history of the organisational communication handbooks printed by Sage. The first *SAGE Handbook of Organizational Communication* (Jablin, Putnam, Porter, & Roberts, 1987) had four editors: two from the communication discipline and two from the management discipline. During the 1980s, organisational communication theorists began to re-evaluate their assumptions and approaches, and organisational communication scholars began to engage in critical and dialectical evaluations of

their subject matter (Taylor & Van Every, 2011). Putnam and Mumby (2014) give a thorough evaluation of this era in the introduction to the *SAGE Handbook of Organizational Communication* where they highlight the importance of discourse and critical studies (p. 10).

Instead of looking at communication in and through the organisation, research in the 1990s began to look at how communication *constitutes* the organisation (CCO); that is, how organisations are constructed and emerge out of communication (Taylor & Van Every, 2011). This new premise of organisational communication theory essentially flipped the notions of earlier management and organisational theories into an entirely different approach (Putnam & Mumby, 2013). This era focused on theoretical forms and practices of organisational communication that developed into the discursive turn. The discursive turn focused on communicative interpretations of the organisation (Putnam & Mumby, 2013).

As organisational communication developed into a discipline, a pluralistic approach was taken with robust communication-centred theories (Putnam & Mumby, 2013) incorporating the implications of the digital world and its ubiquitous existence in organisational life (Leonardi, Nardi & Kallinikos, 2012). Therefore, the trend in organisational discourse (Putnam & Mumby, 2013) had started to include studies in materiality, or the study of the material objects which support organisational functioning, such as a computer, software, or other technological advances (Aakhus et al., 2011; Hardy & Thomas, 2015; Lievrouw, 2014; Orlikowski & Scott, 2015; Putnam, 2015). Accounting for the digital world has become increasingly significant, and it is the latest research turn in organisational communication. Simultaneously, CCO research was increasing in prominence (Putnam & Nicotera, 2009). These research focuses examined the material (or nonhuman) and the social (or human) intersections (Mills & Cooren, 2016) and was defined as sociomateriality (Jarzabkowski & Pinch, 2013). Sociomateriality is defined in greater depth later in this literature review. This section of the chapter, has provided a brief outline of the history of organisational communication and current research trends in the discipline. The next section defines organisational communication as it is connected to the history of the organisational communication discipline.

Organisational communication defined. Within the history of organisational communication, the influence of social psychology in the 1960s and 1970s cannot be underestimated. A major influence on the definition of

organisational communication was Karl Weick. Using Weick's social psychology perspective, communication scholars began evaluating the intricacies and importance of communication in organisational life strictly as communicative events instead of management events (Jablin & Putnam, 2001). From this approach organisational studies sprouted into the realisation that *all* organisational members directly affect the organisation.

Organisational communication, then, is the study of communication events within the organisation. As explained by Modaff, Butler, and DeWine (2011), a "communication-centered approach to the study of organisations" seeks to "understand the central nature of communication in all aspects of organisational functioning" (p.2). Studying organisational communication from a *communicative* approach, therefore, means the research is focused on the practices and conversations that bring purpose and vision to organisations and their members from creation, maintenance, and sometimes to the failure of the organisation (Taylor & van Every, 2014).

Communication *constitutes* an organisation in multiple ways, as Bugstaller (2014) argues, "The primary tool for affecting anything in an organisation is conversation" (p. 24). First, communication is central to organisational creation (Cooren, Taylor, & Van Every, 2006; Putnam & Nicotera, 2010; Taylor, 2011; Taylor & Van Every, 2000). Second, communication is central to both the process and the structure of the organisation (Giddens, 1986; Weick, 1979). For the dynamic processes of the organisation to exist, and the structure to thereby emerge, entrepreneurs, owners, or managers engage in communicative practices (Taylor, 2011; Taylor & van Every, 2014). For clarity, communication practices and events are transactional exchanges of verbal and nonverbal information (Cooren, Kuhn, Cornelissen, & Clark, 2011; Schoeneborn, 2011). Third, the organisation needs members to work toward shared goals to accomplish organisational objectives. Therefore, maintaining organisational visions and objectives are completed through communicative events (Aakhus & Laureij, 2012). Taking each of these criteria into account, organisational communication may be defined as a continual and dynamic process that may be summarised as a set of self-organising conversations (Brummans, Cooren, Robichaud, & Taylor, 2014; Burgstaller, 2014; Schoeneborn, 2011; Taylor and van Every, 2011).

A communicative approach also means considering the communication practices within the organisation and on behalf of the organisation's identity

(Cheney & Christensen, 2001). Internal organisational communication events, or the communication happening inside the firm, affect the organisation's success. Also, organisational communication evaluates the way in which the organisation, as a whole, communicates itself to its stakeholders (Cheney et al., 2013). Communicating with stakeholders is a function of organisational identity management. It is a process of bringing what is happening within the organisation to external audiences (Cheney & Christensen, 2001).

In summary, *organisational communication is a communicative approach to organisational studies with an emphasis on the interactions among organisational members and the material items which support organisational members' work.* Again, this definition was inspired by the social psychology discipline in the 1960s and 1970s. As the discipline matured, the focus on communication as the form and creation of organisational existence heightened (Taylor & van Every, 2011), various theories were developed, and multiple approaches to the organisation were considered (Putnam & Mumby, 2014). Among those approaches was the communicative constitution of organisations.

For this study, organisation is equally a noun and a verb, and this research does not favour one definition or purpose above the other. Organisation is the process and structure of organising people and information to move a group of individuals, or organisational members, toward the achievement of a shared goal (Taylor, 2011). *Organisational communication*, therefore, is the examination of organisations *in the process*, aligning with the organisational communication definition of CCO (Putnam & Nicotera, 2009).

Communicative Constitution of Organisations

Bernard (1968), Tompkins (1967), and Weick (1969) each began to contend that an organisation could not come to fruition or achieve its goals unless communication practices were at its forefront or *the* primary objective of the organisational members. A return to this approach was explicitly noted by Putnam and Nicotera (2009). In this second section of the literature review, I review the current CCO trends. First, CCO will be defined. Second, the influence of Karl Weick is considered. Third, the foremost metatheories about CCO will be detailed. Fourth, the CCO metatheories are combined into six common premises on which researchers can ground their CCO research.

Defining CCO. CCO is a field of research within organisational communication focusing on how “discursive-material configurations are reproduced

and co-produced through ongoing interactions” (Brummans, Cooren, Robichaud & Taylor, 2014, p. 173). In other words, CCO is an examination of written and verbal communication events among organisational members. CCO also accounts for how communication practices and associated behaviours enable organisational objectives, such as consistently meeting a sales goals. CCO, however, is not a new theory.

In organisational communication, theoretical perspectives have changed from viewing organisational communication as communication which happens in an organisational container (Jablin & Putnam, 2001), to a sophisticated conceptualisation of co-constructed interdependencies of communication and organising (Sotirin, 2014). Therefore, CCO takes a holistic approach to organisations (Taylor, 2011). This approach, inspired by the work of Karl Weick (Putnam & Nicotera, 2009), was conglomerated from multiple schools of thought “unified by the idea that organisations are invoked and maintained in and through communicative practices” (Schoeneborn et al., 2014, p. 287). The CCO approach changes the role of communication in organisational life from an ancillary organisational component to the core of the organisational experience. As CCO scholars, Blaschke, Schoeneborn and Seidl (2012) argue, an organisation cannot exist without communication in the organisation.

The influence of Karl Weick. When defining CCO and its precedent in organisational communication literature, we need to begin with the work of Karl Weick. Putnam and Nicotera (2009) explain, “Influenced by the work of Karl Weick to treat the concept of *organisation* as a verb and not a noun; scholars have focused on how communication is the means by which human beings coordinate actions, create relationships, and maintain organisations” (p. 1). Weick’s (1979, 2000) work is frequently mentioned as one of the foundational theories of CCO concepts and research. However, his contributions are often overlooked (Mills, 2009). Weick’s (1979) early work provides a distinct explanation of how organising is a verb.

Weick (1979) expounded on the definition of organising as “consensually validated grammar for reducing equivocality using sensible interlocked behaviors” (p. 3). *Sensible interlocked behaviours* are coordinated, interdependent activities aligned with the intent to accomplish an organisational objective (Weick, 1979). The process of aligning and coordinating sensible interlocked behaviours requires communication (Weick, 2000). Weick (2000) argued that organisational purposes

may only be achieved through communicative practices and suggested that one's communicative practices also reveal the organising structure of power, culture, and the replication of the organisational system (Weick, 1979). Additionally, Weick wrote about the *consensually validated grammar*, or the majority rule. It is common in discursive organisational communication research to focus on the validated grammar or the consensual meaning that builds the common language of the organisation (Mills, 2009); yet Weick (1979) included the word *consensual* regarding the majority rule. In other words, becoming an organisational member means consenting to the hierarchical structure of the organisation, and, therefore, the power structure of that organisation.

Weick (1979) was not writing about power from a critical perspective; he was writing regarding legitimate authority (French & Raven, 1959; Taylor & van Every, 2014)—the process whereby individuals agree on *interlocking behaviours* among organisational members for the sake of the organisation. As a result, according to Weick (1979, 2000), the organisation is enacted on multiple levels of communication practices: in the submission of personal power, in the coordination of organisational practices through defining meaning, and by the process of engaging interdependent behaviours to maintain the organisation. Giddens (1986) structuration theory offers a similar argument. Whether one subscribes to the work of Weick or Giddens, the fundamental argument they both make is that the *organisation is communication*, in the broadest sense of the definition. Weick (1995) declares, “Communication activity is the organisation” (p. 75). While Weick's work was critical for the development of the CCO framework (Putnam & Nicotera, 2009), organisational communication theorists have combined Weick's concepts with other theories, resulting in three distinct CCO approaches.

Three approaches to CCO. Within the CCO literature, there are three predominant schools of thought. They are McPhee and Zaug's (2000) Four Flows Model; the Montréal School of organisational communication (Brummans et al., 2014); and, Luhmann's Theory of Social Systems (Schoeneborn et al., 2014). This section describes each school of thought and their assumptions as related to CCO.

Four Flows Model. The four flows model was influenced by Giddens (1979, 1986, 1993) and was created by McPhee and Zaug's (2000). It delineates *four different flows of communication within the organisation* which constitute the organisation itself. McPhee and Zaug (2000) use the flows to demonstrate the

purposes of messages *in and through* the organisation. The overarching purpose was the intent of replicating and sustaining the organisational system (Brummanns et al., 2014). The communication flows are as follows:

1. *Membership negotiation*. Membership negotiation is the way in which an organisation maintains relationships with its members (McPhee & Zaug, 2000), and, it is the process of socialising new members into the organisation. For example, an organisation may have a new hire orientation week each fiscal quarter to introduce new employees to the organisational vision and goals (Brummanns et al., 2014).
2. *Reflexive self-structuring*. Reflexive self-structuring is the communication flow focused on the broad goals and organisational formalities of the organisation's existence; for example, organisational policies (McPhee & Zaug, 2000; Schoeneborn et al., 2014).
3. *Activity coordination*. In this flow of communication, the *daily task-flow* and role expectations are communicated (McPhee & Zaug, 2000, para. 33). An example may be a weekly newsletter which contains the organisation's events for the week.
4. *Institutional positioning*. Institutional positioning is how the organisation interacts with other organisations (McPhee & Zaug, 2000). Institutional positioning is the equivalent of public relations and the way in which the organisation represents itself in negotiations, alliances, and with niche markets.

McPhee (2015) clarified the definition of *flows* further: "they are interactive, enduring, multiform, and multicurrent; are carried out in multiple places and contexts, often by numerous people, many of whom have no status or intent to speak for the organisation" (p. 488). An example of McPhee's clarification may be an employee posting on social media about positive aspects of their job. The person does not have the status or intent to speak for the organisation. However, by posting on social media about how much they enjoy their job, they are speaking on behalf of the organisation and the benefits of affiliating with the organisation. Also, the person is using a current and interactive communication platform.

In this example, the person posting on social media about his/her positive work experience is working just as McPhee (2015) prescribed. Also, the person would be engaging in two of the four flows. By posting on social media, the employee is engaging in institutional positioning; that is, the employee is communicating to the

audience positive experiences for working on behalf of the organisation which, in turn, can affect the perception of the organisation. The perception of the organisation is a public relations issue. This illustrates how a simple act—posting positive work experiences on social media—fits with McPhee and Zaug's model. According to the Four Flows model, these are the predominant systems of organisational communication, and all other organisational communication systems are dictated by the primary purposes listed above (McPhee, 2015). However, the Montréal School takes an alternative approach to CCO.

The Montréal School. Centring on the collective work of James Taylor (see Brumanns et al., 2014 for a comprehensive list of Taylor's writings), the Montréal School departs from the Four Flows Model. Instead, they argue that communication flows in the organisation exist in the form of four translations. The four translations involve taking the signs and symbols of the organisation and presenting them in a variety of forms to increase understanding and organisational efficiency (Brumanns et al., 2014). For example, when a small firm owner rebrands their firm, they create a new logo (a symbol); and, when he/she shares it with his/her employees they are creating a verbal translation of the logo. If the firm puts the new logo on their website, they are textualising the symbol, which is another form of translation.

The Montréal school suggested that organisational communication is an imbricated process, a process with layered experiences, as demonstrated by the example above. The four translations are outlined as follows. The first translation is the way in which the organisation is a network of practices and conversations. An example of this would be the network that is created among the stakeholders and the organisation - such as the clients and their interactions with the project management team(s). The network of practices are the teams and their interactions with the team leaders, and the team leaders' interactions with each other, with human resources, and with their team members. The team members interact together to improve and support their customer service strategy for their clients.

The second translation is the way in which the organisation engages in collective experiences through distancing. Distancing, according to the Montréal School, is the process of many individuals communicating on a single issue. Yet, one person may be responsible for representing the single issue for, or within, the organisation (Brumanns et al., 2014). For instance, if a team leader writes the memo to human resources on behalf of all the project management

teams, then the rest of the teams are acting out distancing. The message from the various team leaders is ultimately conveyed by that team leader writing the memo.

The third translation is the way in which the organisation undertakes authoring through textualisation, meaning a written text represents the verbal conversation of organisational members. That is, taking “actual practices [and] transforming them into a symbolic event” or artefact (Brumanns et al., 2014; Spee & Jarzabkowski, 2011). Writing the memo to discuss the team leaders’ concerns and decisions about condescending clients is textualisation.

The fourth translation comprises the instances in which the organisation has representation and presentification. This position, or this translation of the organisation, suggested that one person may represent the whole organisation (Brumanns et al., 2014, p.177). Cooren’s (2010, 2012) research on ventriloquism exemplifies this property of the four translations. Ventriloquation is the one speaking on behalf of or representing the many, in other words, an organisation (Cooren & Sandler, 2014). For example, Chester Barnard was hired by AT&T to speak on behalf of the company to expand their business in Europe (Wolf, 1973). Barnard was not AT&T, but he was speaking *as if he was* AT&T since he acted as the representative of the company’s interests.

Another notable point of CCO, according to the Montréal School, is that it draws on Latour’s (2005) Actor-Network Theory by defining communication as an interactional process which includes both human and non-human actors. The Montréal School argues that both human and non-human actors speak on behalf of the organisation (Brumanns et al., 2014). Non-human actors include the material, or the computers, the software, the copy machines; that is, they are all non-human actors who contribute to the success of the organisation. The Montréal School’s perspective on CCO was summarised by Taylor (1993) when he wrote:

I have never been able to figure out how there could be an organisation in the absence of communication, existing before communication and on a material plane distinct from it. It seems self-evident to me that organisation is a product of communication. . .” (p. ix).

While Taylor maintained that the organisation and communication are intrinsically connected, Luhmann claimed that communication is a separate, self-organising experience.

Luhmannian Social Systems Approach. Luhmann’s social systems approach was developed during two distinct periods in his writing. Social systems theory correlated most precisely to CCO during the second period, or Luhmann’s

autopoietic turn (Brumanns et al., 2014). Autopoiesis, as defined by Maturana and Varela (1980), is a system capable of reproducing and sustaining itself. Luhmann's autopoietic turn drew "on Maturana and Varela's (1987) theory of autopoiesis, [wherein he saw] communication as its own object with its own self-structuring properties" (Brumanns et al., 2014, p. 188). Luhmann (1989) explained the connection between communication and organisation: "Social systems are not comprised of persons and actions *but of* communications" (p. 145, emphasis added). Luhmann's works on organisations resonated with the organisational philosophies of Weick (1995) when he wrote, "the communication activity *is* the organisation" (p. 75; emphasis added).

Scholars affiliated with the Theory of Social Systems define CCO as radically constructivist in that communication, as an independent system, is not about shared meaning; it is more concerned with communication for the sake of communicating (Schoeneborne et al., 2014) and the result of communicating is organising (Baralou, Wolf, & Meissner, 2012). Table 3, outlines, in brief, each of the CCO schools of thought. It compares the epistemological and ontological approaches of each school, their respective definitions of communication, the ways in which their ideas connect to organisational communication, and their treatment of agency and non-human agency. This table compartmentalises an overview of the schools of thought for a framework for this research project which focuses on the Montréal School. While more will be written about CCO and GTM in the methodology chapter, the Montréal School's version of CCO best aligned with the approaches of grounded theory.

Table 3. Comparison of the Three Schools of CCO

Comparison of the Three Schools of CCO
(adapted from Schoeneborn et al., 2014)

	Montréal School	Four Flows Model	Luhmannian Social Systems Approach
Epistemology/Ontology	Relational; observer and objects of interest act upon each other	Posits the duality of production and reproduction	Radical constructivist; observer constructs unique reality in a self-referential way and external world determines which self-constructed realities work
Defining communication	Communication is transactional and includes nonhuman actors; actors speak on behalf of the organisation	Communication is transactional and leading to fused emergence of meaning, understanding of power and socially/materially constituted systems	Communication is a self-reproducing process; what matters is not mutual understanding but the continuation of communication
Organisation communication Connection	Emphasis on the organising properties of communication; all kinds of speech acts have the potential to give rise to organisation.	Four communication flows constitute organisation: a) membership negotiation; b) reflexive self-structuring; c) activity coordination, and d) institutional positioning.	Only decision-oriented communication can let organisation emerge. Organisation as autopoietic and self-referential network of decision-oriented communication events
Non-human agency	Text, tools and other material objects are <i>endowed</i> with agency—the capacity to make a difference	Acknowledges technological and other objects enable and constrain the organisation	Social systems are non-human actors in their own right

Six Common Premises of CCO

Despite the differences of the three schools of thought within CCO, there are six common premises of the philosophies underpinning CCO. First, CCO research investigates communicational events. Examining a communication event means accounting for how communication occurs “in and through” (Cooren et al., 2011, p. 1152) the organisation giving no preference to the types of communication events, whether it is talk or text. The second premise encourages CCO research to be as inclusive as possible in the definition of organisational communication by acknowledging all forms of communication. Third and fourth, CCO research acknowledges the co-constructed nature of communication while being as “inclusive as possible regarding what or who is taking part in the constitution organisational process”, thereby including non-human and human actors (Cooren et al., 2011, p. 1152). Fifth, CCO scholars are required to stay within the realm of the communication event, meaning the research is grounded in the action of the communicative process and flow. Sixth, and finally, “CCO scholarship favors neither organizing nor organisation” (Cooren et al., 2011, p. 1154).

The CCO perspective allows the researcher to take a multidimensional approach to the research process with a precedent for holistic, multidisciplinary research (Constantinides, 2013; Kuhn, 2012). Taking a multidimensional approach means being able to account for the interactions which comprise a communication event. Using CCO allows the researcher to use the conversations, the memos, the perspectives of the organisational members, and HR training as layered evidence of how communication maintains the organisation. Also, CCO is fundamentally different from other organisational communication theories, as Blaschke, Schoeneborn, and Seidl (2012) expound:

First, the CCO perspective is primarily concerned with the fundamental question of the *ontological* status of organisations . . . Second, in response to the ontological question, CCO scholars put forth a processual and dynamic understanding of organisations. In other words, they follow the idea that an organisation is not reified and given, but on the contrary, its perpetuation is continuously at stake and necessitates a continuous reproduction of communication.

Accordingly, CCO scholars study organisational communication in order to trace the emergence of organisation as distinct and processual entities, the bounds of which are brought forth by communication activities (p. 883).

No matter the subset of theoretical leanings in CCO scholarship, the purpose of CCO research is to equally emphasise the organisation/organising-communication connection (Martine et al., 2016). This harks back to Taylor’s (1993) point when he

states that organisational life is a communication life; organisation and communication are inherently connected whether the communication occurs through face-to-face conversations or mediated messages, like instant messaging or email.

In this section of the chapter, I have outlined the three schools of CCO and the six common premises of CCO scholarship. In addition to CCO, other key concepts in technology and organisational communication of relevance to this research need to be explored. This I do in the next section.

Key Concepts in Organisational Communication

This section of the literature review highlights some specific concepts from existing literature in organisational communication and management communication. The relevance of these concepts to the research emerged *during* the theoretical coding and include: organisational socialisation and literacy, soft skills, workplace relationships, and corporate language-based communication avoidance. Each of these concepts has a body of literature associated with it which I briefly survey after providing an initial definition of the concept. I begin with organisational socialisation and literacy.

Organisational socialisation and literacy. The process of organisational socialisation is connected to organisational literacy. Organisational socialisation orients organisational new-comers to the organisation and teaches them the ways in which the organisation *thinks* (Saks & Gruman, 2014, p. 261). In his seminal study, Schein (1968) codified organisational socialisation in relation to organisational culture. Schein and Van Maanen (1977) noted that an organisational member must be taught how to act within the culture. They defined organisational socialisation as a “process by which an individual acquires the social knowledge and skills necessary to assume an organisational role” (p. 962). Organisational socialisation may happen formally or informally (Chao, 2007). Since organisational life has a profound impact on organisational members, organisational socialisation continues to be a topic of organisational studies (Allen, Eby, Chao & Bauer, 2017).

Organisational socialisation may be classified as a tenant of organisational literacy.

Organisational literacy is the ability to negotiate complex systems (Smith, 2005) *after* socialisation. Organisational literacy, or workplace literacy, was defined in Bruce’s (1999) formative article on information literacy. Bruce (1999) explains that information literacy, or knowledge management, is critical to organisational success. Organisational literacy is the ability to understand the information and the

process of the organisation in order for one to successfully complete the tasks assigned to their organisational role (Hughes, 2014). Therefore, organisational literacy occurs as an individual internalises the knowledge she/he received from her/his experience in the organisation.

Hughes (2017) noted the nuanced nature of organisational literacy, when he argued:

Organisational literacy is the ability to navigate, negotiate, and interpret organisational processes, policies, structures, and texts. Individuals who are organisationally literate have learned how to engage effectively with organisational texts and textual sequences. These individuals are able to interpret dominant forms of literacy (e.g., regulations, contracts, policies, licenses, procedures, and text-based dialogues) in ways that often elude individuals who are uninformed regarding the knowledge, intent, or assumptions behind such texts. Smith describes unsophisticated readers as those who are not able to read texts critically, and more sophisticated readers as those who are able to strip texts of their references to institutional power processes, thereby *seeing* texts as potential pretexts for coordination and control (p. 116).

While organisational literacy may appear like organisational socialisation, it is not. Organisational literacy *educates* organisational members, clients, and other stakeholders, *in addition to* matriculating new organisational members. Both organisational socialisation and organisational literacy are enabled by interpersonal communication skills – otherwise termed soft skills.

Soft skills. The literature describes soft skills as communication skills and argues that soft skills are central to talented employees as well as to the successful completion of a project (Riggio & Saggi, 2015; Schwalbe, 2013; Skulmoski & Hartman, 2010; Sultana, 2014). Soft skills are contrasted with *hard skills*, or the highly technical skills required when working with material objects. As Sultana (2014) explains, soft skills are interpersonal skills with broad applications (p. 745) and have been a focus of human resource management since the 1960s (Kamin, 2013). In the ICT sector, soft skills have been acknowledged as a useful resource in the project management discipline and literature (see Bourne, 2015; Pritchard, 2013 as two examples). As a subset of project management, communication skills and other behavioural competencies (Dillon & Taylor, 2015), have been examined with a specific interest in ICT project management (for examples, see Dillon & Taylor, 2015 or Schwalbe, 2013). Behavioural competencies include skills such as communicating with organisational members and stakeholders, or being able to manage a project through adequate use of resources (Dillon & Taylor, 2015; Schwalbe, 2013). Behavioural competencies mirror soft skills in definition.

Kamin (2013) further discussed the value of soft skills from the position of work place behaviour. She claimed a web of skills are needed for soft skills competency, such as creativity, critical thinking, oral and written communication, teamwork, leadership, professionalism, and sensitivity to diversity (p. 9). Kamin (2013) argued that motives also need to be considered as underlying influences in the use of soft skills. For example, an organisational member may have superb oral communication skills while also having strong stereotypes about other organisational members. According to Kamin (2013), the stereotype would affect the oral communication skills of the organisational member.

Bambacas and Patrickson (2008) suggested, in their research on interpersonal communication skills, that understanding the relationships and systems in the organisation, or with clients, is one way to create commitment and connection among employees and/or clients. Among the interpersonal communication skills that create commitment and connection is active listening.

Active Listening. Roger and Farson (2015) coined the phrase active listening in 1957. It is defined as “the process of receiving, understanding, remembering, evaluating, and responding to verbal [spoken or written] and/or nonverbal messages” (DeVito, 2015, p. 170). It has distinct elements, such as nonverbal attentiveness, asking clarifying questions to understand meaning, and paraphrasing back to the speaker what the listener heard (Bodie, Vickery, Cannava, & Jones, 2015). Bodie et al. (2015) argued that active listening is important, yet it is part of an overarching communication exchange. In this assertion, Bodie et al. (2015) agreed with Schein (1993) who argued that active listening is a subset of dialogue. “Active listening is not the central focus or purpose” (Schein, 1993, p. 43). Yet, it is critical for workplace relationships.

Workplace relationships. Deetz and Eger (2014) argue relationships are the foundations of organisations. In her research, Sais (2009) further claimed that workplace relationships among co-workers and clients have a profound impact on the organisation for good or ill. A portion of that impact is underscored by how much trust exists in the organisation.

Trust is difficult to define, and the definitions are often left to the researcher (Bamberger, 2011). In Mayer, Davis, and Schoorman's (1995) model of trust, they highlight the importance of vulnerability. Brown, Gray, McHardy, and Taylor (2015) emphasise the importance of dependability and reliance. Sousa-Lima,

Michel, and Caetano (2013) focus on support. Kassenbaum (2004) provides a comprehensive definition summarising the characteristics of trust.

Trust is an expectation about a future behaviour of another person and an accompanying feeling of calmness, confidence, and security depending on the degree of trust and the extent of the associated risk [in the relationship]. That other person shall behave as agreed or unagreed but loyal, or at least according to subjective expectations, although s/he has the freedom of choice to act differently. The other person may also be perceived as a representative of a certain group (p. 67 as cited in Dobelt, Busch, & Hochleitner, 2014, p. 9).

Trust, then, is related to feelings of vulnerability and risk, where those uncomfortable feelings are alleviated through structures and/or relations of support, loyalty, reliability and dependability.

Building trust at work. In order for an organisation to be created and maintained, a sense of trust must exist among the individuals affiliated with the organisation and should be emphasised through communication practices (Shockley-Zalabak, Morreale, & Hackman, 2010). Yet, the anatomy of trust in an organisation needs more exploration. Sousa-Lima et. al (2013) noted that trust in organisational research is “underemphasized” (p. 424). In a content-analysis of organisational trust research, De Jong et al. (2016) arrived at the same conclusion. There is a link among trust, employee behaviour, and firm performance (Brown et al., 2015), and organisations need to support trust practices, or practices which create a supportive and fair environment (Sousa-Lima, Michel, & Caetano, 2013).

From their research, Shockley-Zalabak and Morreale (2011) created five dimensions associated with organisational trust: competence, openness and honesty, concern for others, reliability, and identification (p. 40). Competence is organisational efficiency and a reflection of how strongly organisational members *believe* in the organisation. Openness and honesty are strategies for resolving conflict and for keeping confidences – which are in turn directly related to having a positive, safe, and open flow of communication. Concern for others is reflected in the concern for employees and stakeholders by the organisational culture.

“Employees trust the organisation when they believe their managers are concerned about their personal well-being” (Shockley-Zalabak & Morreale, 2011, p. 41).

Reliability is the behavioural follow-through of open and honest communication in the organisation. Finally, identification is the connection of organisational members to the organisation based on core values. As Priem and Nystrom (2014) explain, identification is a result of finding common ground among organisational members.

Management scholars link common ground to successful communication practices and the effective achievement of organisational goals (Priem & Nystrom, 2014). Common ground is management literature's form of shared meaning. However, it has a behavioural component beyond shared meaning which is important for trust and the enactment of organisational life (Bechky, 2003). Linguistic philosophers Clark (1996) and Stalnaker (2002) argue that common ground is an information-based communication act with mutually shared definitions and is understood to be mutually shared among organisational members which results in presupposed behaviours (Priem & Nystrom, 2014, p. 767). Common ground is needed for trust, and can help transform difficult working relationships (Bechky, 2003). With a lack of common ground and without forethought to devising an organisational culture of trust (Shockley & Morreale, 2011), organisational culture produces reactive and suspicious environments. These challenges extend to situations where a shared language does not exist, such as when co-workers do not speak the same technical or disciplinary language.

Corporate language-based communication avoidance. Corporate language-based communication avoidance (CLBCA) is communication avoidance specifically contained within the organisational communication sphere. It is nuanced in its difference from communication avoidance as defined by interpersonal communication scholars (Lauring & Klitmøller, 2015). CLBCA was originally understood as an intercultural communication problem. For example, organisational members that speak different spoken languages tend to avoid communicating with each other (Lauring & Klitmøller, 2015). In this research, a similar challenge was identified. Communication was avoided if the conversation or interaction required the explanation of highly technical information in a message specifically modified to make sense to the audience, client or co-worker. Of key concern in this research is that individuals avoid communicating with each other if they do not feel like they can connect through the same language. Speaking in different languages creates moments of uncertainty and confusion requiring co-workers to make sense of what is happening.

Sensemaking. Sensemaking is the process of creating meaning in organisational life from moments of uncertainty; it is an on-going co-creation process among organisational members (Ancona, 2012; Taylor & Van Every, 2014) and was conceptually identified by Karl Weick (1969). When defining CCO and its precedent in organisational communication literature, Weick's work begins the

discussion. Putnam and Nicotera (2009) explain, “Influenced by the work of Karl Weick to treat the concept of ‘organisation’ as a verb and not a noun, scholars have focused on how communication is the means by which human beings coordinate actions, create relationships and maintain organisations” (p. 1). While Weick’s (1969/2000; 1979) work on organising is frequently mentioned as one of the foundation theories of CCO concepts and research, his definitions and considerations are lost in the current flow of CCO research. Weick’s (1979) early work provides a distinct explanation of the ways in which organising is a verb as he began publishing theories on sensemaking.

Sensemaking is a multifaceted theory including a variety of explanations for organisational uncertainties. For example, it explains conflict management as well as providing a framework for organisational members and their need for collective action (Weick, Sutcliffe, & Obstfeld, 2005). As Taylor and Van Every (2000) explain, “Sensemaking is a way station on the road to a consensually constructed, coordinated system of action” (p. 275). Sensemaking aligns with CCO as it brings meaning to the behaviours—communicative or otherwise—of individuals attempting to create and maintain organisations or collective action through unified goals and it examines the process whereby this occurs (Deetz & Eger, 2014). In the terms of CCO, meaning creation during sensemaking processes emerges as a communicative event (Cooren et al., 2011). “Sensemaking is, importantly, an issue of language, talk, and communication” and relies on the “interplay of action” (Weick et al., 2005, p. 409). It goes beyond the choice of the individual, though important in the theory, and acknowledges the need to account for circumstances and macro-contexts (Weick et al, 2005; see Snook, 2011).

Weick, Sutcliffe and Obstfeld (2005) exemplified and redefined how sensemaking works with organizing. They outline the primary points and value of the approach. First, sensemaking organizes flux; it starts with chaos and change. Second, sensemaking starts with noticing what is normal and what is not through an interpretive process. It acknowledges what is out of order and needs to be realigned for organisational success. Third, labelling occurs. Labelling is the process of acknowledging what is in chaos and creating a treatment to be applied to the chaos. It is the behaviour employed to correct the problem. Fourth and fifth, sensemaking is retrospective and about presumption. While it is easy to “portray sensemaking as more cerebral . . . sensemaking starts with immediate actions, local context and concrete cues” (p. 412). Taylor and Van Every (2014) add to the definition of

sensemaking arguing that the process requires three components in the *purposeful* activity: an actor, an acted-on, and an interpretation of what is happening. Important to sensemaking are the social and systemic worlds in which the organisation functions. The social part of sensemaking accounts for the ongoing communicative events that enhance and perpetuate the organisation. Finally, sensemaking is about action and communication. It answers the questions: ‘what is going on here?’ and ‘what do I do next?’ and ‘who else needs to be involved?’

Sensemaking is an activity that communicates events into existence and then solves their problems once the system, organisation or organizing are in place (Weick et al., 2005). Communication [is] an ongoing process of making sense of the circumstances in which people collectively find themselves and the events that affect them. The sensemaking, to the extent that it involves communication, takes place in interactive talk and draws on the resources of language in order to formulate and exchange through talk. As this occurs, a situation is talked into existence and the basis is laid for action to deal with it (Taylor and Van Every, 2000, p. 58).

Sensemaking fills a distinct gap in organisational communication theory. During the dialectical turn of organisational communication, research became centred on the language of the organisation and micro-level events happening in the organisation (Putnam & Mumby, 2014). Sensemaking is also a form of micro-level analysis in the organisation (Weick et al., 2005); yet, its specific focus is tension, contradiction and the interplay of how to recreate flow during such communicative events. Sensemaking is most apparent in organisations when “the current state of the world is perceived to be different from the expected state of the world” (Weick et al., 414). The evidence and process of sensemaking aligns with the current call for research in CCO. To date, much CCO literature is focused on how organisations are maintained. However, “conflicts and contradictions should be addressed as being of at least equal importance in explaining both continuity and change” (Brummans et al., 2014, p. 188). Combining sensemaking with CCO—with already acknowledged theoretical congruency (Blaschke et al., 2012)—responds to the concern of CCO scholars about the lack of literature examining conflicts and contradictions.

Among organisational and management scholars, sensemaking has an enormous influence (Brown, Colville, & Pye, 2015). The management and organisational literature on sensemaking can be divided into five basic themes: a)

sensemaking through discourse; b) the politics and power associated with those trying to make sense; c) the micro-macro sensemaking process; d) sensemaking and identity; and e) sensemaking and organisational change (Brown et al., 2015). In the communication literature, sensemaking has taken a critical turn evaluating marginalized groups and their employment experience (Bisel & Arterburn, 2012; Bryant & Sias, 2011; Mize Smith, 2012; Shenoy-Packer, 2015). The theory appears in the interpersonal communication literature when related to disaster situations (Coffelt, Smith, Sollitto, & Payne, 2010; Smith, Coffelt, Rives, & Sollitto, 2012; Weber, Thomas, & Stephens, 2015), as well as leadership and corporate social responsibility (CSR) (for examples, see Ancona, 2012; Angus-Leppan, Metcalf, & Benn, 2010; Kelley & Bisel, 2014). In the sensemaking literature, little has been written about the chaos that can be associated with the struggles that SMEs contend with, the continual change associated with the day-to-day challenges of web development (Rouleau, 2005). This includes issues common to web development firms and the way small firms make sense of organisational change and technology. Sense making can also occur from the top down. This process is called sensegiving.

Sensegiving. Sensegiving is primarily an organisational leadership strategy (Gioia & Chittipeddi, 1991) and is the process of creating shared reality with organisational members through “evocative language and the construction of narrative, symbols, and other sensemaking [or persuasive] devices” (p. 58). Other scholars (Maitlis & Lawrence, 2007) have demonstrated that any stakeholder may participate in the sensegiving process (Maitlis, 2005). For examples, organisational members may tell stories to perpetuate organisational values and ideas. Sensegiving is another way in which organisational members make sense of their shared experience in the organisation. Associated with sensegiving is whether or not one has *authority* to make sense for others as well as to include or exclude them from the sensemaking process (Filstad, 2014). In the case of this research thesis, the language of sensegiving is most usually specific to technology.

Key Concepts in Technology and Organisational Communication

In addition to the organisational communication literature, literature that combines organisational communication and technology is relevant to this research. The pertinent concepts in this body of research in technology and organisational communication are: ambidexterity, materiality, and sociomateriality. Ambidexterity is a strategic management strategy. Materiality are the physical components of the technology, and sociomateriality is the human interaction enabled by the material.

Since ambidexterity is a management strategy that effects both the material and the sociomaterial components of a firm, it will be discussed first.

Ambidexterity. The conflict of time, production, and what to produce is an organisational tension common in the organisational experience. Ambidexterity is a strategy applied to alleviate the tensions that exist in high-tech firms that develop and maintain high-tech services and hardware (Ajayi, Odusanya, & Morton, 2017; Havermans, Den Hartog, Keegan, & Uhl-Bien, 2015). Furthermore, ambidexterity is a series of decision points that attempt to balance two opposite approaches to an organisation's vision. Those approaches are exploitation and exploration (Gibson & Birkinshaw, 2004). Exploration refers to the firm's activities which are "characterised by research, discovery, experimentation, risk-taking, and innovation" (He & Wong, 2004, p. 481). In contrast, exploitation refers to the organisation's activities which are characterised by "refinement, implementation, efficiency, [and] production" of an already existing product or service (He & Wong, 2004, p. 481). Ambidexterity mediates exploration and exploitation by giving neither organisational activity precedence over the other (Gibson & Birkinshaw, 2004). The balance among these two focuses is important for web development SMEs since they have limited resources (Ajayi et al., 2017; Havermans et al., 2015). In summary, ambidexterity is a firm's ability to simultaneously pursue operational efficiency and organisational innovation (Katic & Agarwal, 2018).

Materiality. Materiality is "a physical mode of being, namely possess[ing] spatial attributes—a unique location, shape, volume, and mass" (Faulkner & Runde, 2012, p. 51; see also Kallinikos, 2012). Materiality acknowledges physical artefacts, such as a desktop computer (Leonardi & Barley, 2008). The computer is physical, and, therefore, material which means it possesses materiality.

Leonardi (2012) draws on the work of Orlikowski (2000) when he writes:

Some aspect of technology, [the material aspect] . . . is intrinsic to the technology, not part of the social context in which the technology was used. In other words, when everyone packs up their bags and goes home at the end of the day, those inherent properties of technology do not go away (Leonardi, 2012, p. 28).

As this quote illustrates, through an example of materiality, we learn that even when organisational members leave work and go home, their websites are still present on the Internet; their servers are still running; their printers or computers still exist on their desks. Materiality is, therefore, the mass and matter of the organisation (Barad, 2003).

However, for some scholars, materiality is wrought with complicated and layered meanings as they argue that materiality is not only mass and matter (Aakhus et al., 2011). This argument stemmed from computer-mediated communication research of the 1990s (Gillespie, Boczkowski, & Foot, 2014). The type of hardware, which are labelled materialities in the theory, are also the symbols and properties of technology that differentiate technology firms from other hardware based engineering firms and practices. The intricate difference of materiality provides a precedent to describe the nuanced ways in which ICT technology—hardware and software—enables organising for the ICT industry and for all other organisations which engage ICT services. Adopting a dualistic understanding of materiality, which combines the mass and matter perspective with the symbols and meanings perspective, requires a research approach which can account for both dynamics. This may be done through research on sociomateriality or discursive approaches which include materiality (Hardy & Thomas, 2015; Orlikowski & Scott, 2015; Putnam, 2015).

One way to account for both dynamics is to take a discursive approach – though acknowledging that discursive approaches to the study of organisations have been criticised for failing to acknowledge the material (Alvesson & Kärreman, 2000, 2011). Consequently, an increased number of material studies *through a* discursive lens have appeared in recent years (for examples, see Hardy & Thomas, 2015; Orlikowski & Scott, 2015; Putnam, 2015) - an approach which is consistent with CCO. A discursive approach to materiality acknowledges language and its interplay with the material; yet, it can reveal the difficult nature of analysing an organisation with material objects. For example, how does one define *phone* given the history of telephones and the recent transformational changes of the smartphone? The word phone, now, means much more than it has in the past.

Alvesson and Kärreman (2011) and Sterne (2014) acknowledge the challenge of defining materiality as well as the words associated with it, such as technology. Leonardi (2012) notes the complex interactions of communication and technology. The confusion and difficulty of understanding the connotations of technology and communication are, according to Leonardi, the result of divergent meanings for common words like *technology*. For example, over time, the term technology became an all-encompassing word for an increasing array of industries, subindustries, and processes (Leonardi, 2012). Again, the word *technology* or the

word *phone* may conjure a host of concepts and objects, all of which will likely apply to the definition of the word.

As Lievrouw (2014) suggests, materiality studies have a messy history and cannot be divided into separate camps with clear dividing lines. As Barad (2003) argues, “Language matters. Discourse matters. Culture matters. However, there is an important sense in which the only thing that does not seem to matter anymore is matter” (p. 801). When considering the literature on materiality and language, or other symbols, I take a pragmatic approach. That is, materiality is a material with shape, mass and volume comprising a physical existence (Kallinikos, 2012). As Orlikowski (2007) claimed, material does matter, but it needs to be defined differently when connected to the social needs of the organisation; she called this *sociomateriality*.

Sociomateriality. Sociomateriality is the connection of matter (Barad, 2003) to the symbolic (Ashcraft, Kuhn, & Cooren, 2009). Materiality can exist separate from people and organisation, yet, sociomateriality cannot (Leonardi, 2013). Orlikowski (2007) introduced sociomateriality when she wrote, “organizing is inextricably bound up with materiality” (p. 1435). Consequently, to define sociomateriality is to combine materiality with social, behavioural practices in organisational practices (Faulkner & Runde, 2012; Leonardi & Barley, 2010; Scott & Orlikowski, 2012). “Technology has arguably become an integral aspect of most business operations” no matter the firm’s size (Orlikowski & Scott, 2008, p. 434). This means the use of hardware and software in an organisation is critical to organisational success. Therefore, sociomateriality has the potential to clarify the interconnection between humanity and technology (Leonardi, 2013; Orlikowski & Scott, 2008). The extant sociomateriality literature is diverse and exists on a spectrum.

Research on sociomateriality appears in disciplines such as design (Endrissat, Islam, & Noppeney, 2016), as well as in studies of social problems such as homelessness (Novak, 2016). Alternatively, research topics may include traditional technology topics, such as social media usage (Albu & Etter, 2016). In organisational communication research, sociomateriality is increasingly used in combination with CCO theory (Constantinides, 2013; Jarzabkowski & Pinch, 2013). The intersection of sociomateriality with CCO demonstrates the theoretical nature of sociomateriality and the ways in which CCO may be integrated into technology studies (Leonardi, 2013; Mahama, Elbashir, Sutton, & Arnold, 2016; Martine et al.,

2016; Tunçalp, 2016), as well as sociomateriality's contemporary influence in management studies (Jarzabkowski & Pinch, 2013).

Sociomateriality may be conceptualised from three primary perspectives. Orlikowski (2007) defines sociomateriality as the “recursive intertwining of humans and technology in practice” (p. 1437); she is suggesting that humans and technology cannot exist without each other. In contrast, Leonardi and Barley (2008) claim sociomateriality is an interwoven reality of the material and social. They maintain that humans and technology are interdependent. However, Kautz and Jensen (2013) argued that these two approaches to sociomateriality is in direct conflict suggesting that sociomateriality has two distinct ontologies.

For Leonardi (2011), sociomateriality is concerned with imbrication. In organisational communication, imbrications are the layers of organisational communication events and practices that simultaneously occur and overlap to create patterns in the communication flow. These overlapping, simultaneous communication events constitute the organisation (Taylor, 2011). This layered metaphor also applies to sociomateriality. Leonardi (2011, 2013) writes that imbrication describes the intertwining organisational patterns, or infrastructure, created by the interactions between the human and the technology. Important in both Taylor's (2011) and Leonardi's (2011, 2013) definitions are the words: layers and patterns. Notwithstanding the patterns and connections, “imbrication [also] implies separability” (Kautz & Jensen, 2013, p. 24; see also Introna & Hayes, 2011). In other words, each layer of the material (the technology) and the human are distinct and separate (Putnam, 2015); and sociomateriality is the point of intersection where the human and the material meet. For instance, a laptop, or other hardware, is required by organisational members to function in an organisation, and its software functions to connect organisational members so they can complete organisational tasks and keep up-to-date with the organisation's events. However, the organisational member with the laptop is not the laptop: they are interconnected but separate.

Leonardi (2013) purports, “Indeed, the ontology [of sociomateriality] is that constitutive entanglement is simply the nature of any practice” (p. 71). As Orlikowski (2007) stated in the early sociomaterial research, technology and human existence, as far as organisational life is concerned, are enmeshed into one. Understanding the enmeshment of materiality and humanity, Leonardi (2013) encourages sociomaterial scholars to approach the research process from one of two

perspectives: agent realism (Barad, 2003), or critical realism (Bhaskar, 2008/2013; Sayer, 2000) depending on how well the respective theoretical assumptions fit the research.

Agent realism and critical realism take different approaches to an overarching-realist ideology as drawn from the sciences. Agent realism claims that the material and human are inseparably connected (Barad, 2003). For example, software companies cannot exist without the internet and computers. Humans and hardware/software are enmeshed for organisational existence. In contrast, critical realism supposes that a circular process of reality; that is, meaning and patterns—not interconnectedness of the human with the technology—dictate the interaction. For example, a university professor may use technology in his/her classroom, but the student learning is not dependent on technology in the classroom. After evaluating agent realism and critical realism, *this research project takes an agent realist approach* (Barad, 2003; Orlikowski & Scott, 2008) because communication in web development firms *is dependent on the material*. This position links back to CCO and its acknowledgement that communication events must account for the human and non-human actors in the organisation.

The links between sociomateriality and CCO help us to consider how organisational members negotiate their concerns about communicating using the technology in the organisation. For example, a small software firm is dependent on their hardware for their success. It also means “showing how some of these concerns manage to matter more than others by speaking to, for, with, though, or against each other” (Martine et al., 2016; Orlikowski, 2007). Martine et al. (2007) suggest sociomateriality is complex and fraught with tensions, just as CCO is. CCO includes the human concern about the human/material intersection; that is, sociomateriality is a human-centred perspective despite the organisational tensions the technology may enable (Orlikowski, 2007).

High-tech Organisational Communication Literature

The first half of the literature review accounted for the research from the perspective of the organisational communication discipline by defining the discipline, reviewing CCO, and by defining the key concepts that concern the intersection of sociality and technology. The three key concepts were materiality, sociomateriality, and organisational tensions. In the next section of the literature review, a brief history of high-tech organisations and organisational communication research, as well as research about high-tech firms in the larger communication

discipline is provided. This section also includes pertinent literature from disciplines beyond communication.

High-tech organisations in organisational communication.

Organisational communication and high-tech firms became a topic of interest in the mid-1980s. The primary research focus at the time was technology and the unique organisational cultures that emerged from technology firms. Sprague and Ruud (1988) were convinced that computer technology in the workplace was a new way of defining the organisation (p. 169). However, for them (Sprague and Rudd, 1988), it was unusual for an organisation to be completely enmeshed with and thrive because of new technologies. For example, in the 1980s, a small bookstore could thrive with a basic cash register. Now, the bookstore would likely have a website; they would engage in e-commerce; and, their point-of-sale system may be a tablet instead of a cash register. The then-unique nature of cultures enmeshed with technology was captured by the writings of Isenhardt (1987) and Kelly (1985) and prove to be equally informative now.

Isenhardt's (1987) premise was that high-technology firms have "a distinguishable culture" (p. 36; see also Larsen & Rogers, 1985). She writes, "High tech culture emphasizes innovation, risk-taking, frequent changes in assignments, and a relatively low degree of job structure" (p. 36). From the literature, Isenhardt (1987) concluded that "in high tech companies, the nature of the work and the workers make [interpersonal communication] skills even more central to success" (p. 36). Interpersonal communication became a central component of a distinguishable culture in high-tech organisations. Kelly (1985) saw glimmers of the culture to which Isenhardt (1987) was referring in her research.

Kelly (1985) identified storytelling as a prominent feature of organisational culture. She found that entrepreneurs were the heroes of the high-tech stories, encouraging *almost-mythical* narratives of entrepreneurs such as Bill Gates, Paul Allen, or Steve Jobs (see also Drucker, 2010 and Peters, 2010). Also, included in Kelly's research was the need for high-tech firms to break management social norms. She called these equality tensions. Equality tensions are points of conflict that occur during a high-tech firm's attempts to balance their exploitation or exploration tensions (Andriopoulos & Lewis, 2009). The stories Kelly (1985) explored revealed that organisational members were caught-up in "issue[s] of control or lack of control over organisational outcomes" (p. 56). While a narrative analysis, it was also a study on tensions. She writes, "Organisational stories reflect

basic survival issues—how people cope with the complexities and dualities of organisational life and, as such, are an appropriate research focus for interpreting organisational culture.”

After the high-tech organisational cultural studies of the 1980s, the research trend shifted to examine computer-mediated communication (CMC). Compton, White, and DeWine (1991) uncovered early in this research era that people in high-tech firms preferred CMC. Notably, they concluded that organisational members believed their preference for CMC also “influenced basic organisational processes” and resulted in “alterations in their work” as compared to organisations less inclined to CMC practices (p. 39). As technology infiltrated organisations in the 1980s and 1990s, it was speculated that face-to-face communication would be maintained. However, as CMC research has continued, studies have concluded that individuals in high-tech firms prefer to communicate through the computer and not face-to-face (Gnambs, 2015).

Each new technology changes the communication flow in high-tech organisations. For example, research in CMC morphed from studying communication emails (Flanagin, 2000; Taylor, Flanagin, Cheney, & Seibold, 2001; Walther, 1996; Zorn, Flanagin, & Shoham, 2011) to research on text messaging (Kiddie, 2014); and, to include research such as the cross-over between work and personal online personas and communication (Jian, 2013). Furthermore, as hardware and software became increasingly prolific in the workplace, as a means to achieve organisational efficiency, CMC research explained what technology could mean for the organisational cultures and organisational membership of high-tech firms (Leonardi, 2013). In addition to organisational communication literature on high-tech firms, research literature emerged in organisational communication rhetoric, management, project and knowledge management, and networks.

Rhetoric. A subset of organisational communication research is organisational rhetoric or the ability and strategies to persuade, speak well, and evaluate the symbols of language and culture in the workplace (Lundsford, Wilson, Eberly, 2009). Rhetoric became a focus with the seminal work of Putnam (1982) through her use of Burke (1969) as well as early research by Cheney (1983). Consequently, organisational communication and rhetorical studies have a long-standing relationship providing insight into the language and persuasion inherent in organisational communication (McPhee & Tompkins, 1985; Putnam & Mumby, 2014a).

In the early years of organisational communication research and high-tech firms, Vaughn (1988) determined that organisational discourse is employed to achieve results by sharing only positive information with stakeholders and employees. Additional rhetorical analyses centred on internal organisational challenges when an organisation is confronted with strategies to prioritise—meaning, exploiting pre-existing technology or develop new technologies—and its effects on organisational legitimacy. Organisational legitimacy is the socially perceived value of the organisation (Ruebottom, 2013). Ruebottom's (2013) discourse analysis concluded that an organisation's focus, either the exploration of new technology or exploitation of a developed technology, determined their organisational communication strategies as well as organisational identity which affected the way the organisation was managed.

Management. Some management research readily recognised communication as part of the success formula for high-tech organisations. Badir, Buchel and Tucci (2012) state that “effective communication and information processing are essential to a [high-tech] firm's success” (p. 914). In their 2012 case study, they analysed how organisational boundaries are negotiated to develop products and improve communication with strategic partnerships. While the negotiation process is not the focus of the study, it does reveal that interpersonal communication appeared to be the most explored communication phenomenon in high-tech firms. Mangrum et al. (2001) suggest “that informal, face-to-face interactions are . . . critical to the achievement of collaborative work” in high tech industries (p. 316), and it is also known that precise internal communication is central to organisational success in these firms (García-Morales et al., 2011).

One of the research focuses on communication in management is knowledge management. Knowledge management is defined as strategies that assist organisations in gathering, organising, and disseminating knowledge in an attempt to improve the financial and time effectiveness of an organisation (Dalkir, 2013). It is a noted communication challenge (Jensen, 1998). Considerable research has been conducted on the knowledge management aspects of high-tech organisations (Adler et al., 2009; Alvesson, 1993; Andriopoulos & Lewis, 2009; Bouhnik, Giat, & Sanderovitch, 2009; Büschgens et al., 2013; García-Morales et al., 2011; Heavin & Adam, 2012; Jasinski, 2005; Odorici & Presutti, 2013). Knowledge management may be divided into two categories: explicit, or codified, knowledge and tacit, or personal, knowledge (Hansen, Nohria, & Tierney, 1999; Kukko, 2013; Mathiassen

& Pourkomeylian, 2003; Schwalbe, 2013). An example of explicit knowledge is software development knowledge or how to code a software programme. Tacit knowledge is the personal knowledge “embedded in individual experience, and it involves intangible factors such as personal beliefs, perspectives, and underlying values” (Mathiassen & Pourkomeylian, 2003, p. 66). Since knowledge management is fundamentally a communication practice and concern, both explicit and tacit knowledge need to be managed in a software development organisation through strategic communication strategies (García-Morales et al., 2011).

Mathiassen and Pourkomeylian (2003) explain explicit knowledge management as “knowledge [that] is extracted from the persons who created it, made independent of those persons, and reused for various purposes” (p. 67). It may be saved in books, manuals, documents, sound bites, images, video, or other graphic representations (Dalkir, 2013). In many business models, computing hardware is perceived as a medium to transfer and store *extracted* knowledge. In the software development industry, this is no different. Having codified knowledge in a database allowed for anyone in the organisation to “search for and retrieve the same knowledge without having contact with the person who originally developed it” (Mathiassen & Pourkomeylian, 2003, p. 67). Explicit knowledge is used to teach or train new employees (Dalkir, 2013), and it is a tangible form of knowledge that assists in the standardisation process of the organisation. An example of this is a policy and procedures manual.

In contrast to explicit knowledge, tacit knowledge is intangible and can be more difficult to identify. It tends to reside in “the heads of the knowers” (Dalkir, 2013, p. 8) and is communicated through face-to-face or other informal communicative practices (García-Morales et al., 2011; Mangrum et al., 2001). Mathiassen and Pourkomeylian (2003) emphasised the importance of implicit knowledge management within the software industry by explaining that tacit knowledge in the industry is developed in brainstorming sessions and person-to-person conversation. Dalkir (2013) explained tacit knowledge as: a) the ability to be flexible in a fluid environment; b) the ability to collaborate, share a vision, or transmit culture; c) the one-on-one, face-to-face transfer of experiential knowledge; and d) the know-how, know-why, and care-why about the service or product (p. 8). Explicit and tacit knowledge management is needed and important for growth in a software organisation.

Knowledge management in software firms. For a decade, literature has established the need for anticipatory knowledge management strategies for software firms and software process improvement (Mathiassen & Pourkomeylian, 2003). Since software development is primarily a social activity (Valencia-García et al., 2010), a considerable amount of research has explored teamwork in high-tech firms. Knowledge management strategies are the result of a comprehensive research discipline (Akhavan, Ebrahim, Fetrati, & Pezeshkan, 2016; Serenko, 2013), and include topics such as effective and needed, spontaneous, face-to-face problem solving among employees and teams in high-tech organisations to share valuable tacit knowledge and create solutions (Mangrum et al., 2001).

Knowledge management is central to software development organisations (Herbsleb & Moitra, 2001; Odorici & Presutti, 2013). Darroch and McNaughton (2003) argued that knowledge management oriented organisations are more successful than market oriented organisations because their information can be shared with future organisational members. Darroch (2005) also argued that innovative firms with knowledge management strategies were more effective in resource allocations, and as a result, would be more innovative. Knowledge management implied advanced communication skills that develop over time (Kukko, 2013).

Kukko (2013) claimed that small software firms grow organically which requires increased attention to knowledge management. She also exposed the barriers of tacit knowledge sharing in software development organisations. The knowledge barriers were divided into three categories: individual, organisational, and technological. The individual knowledge barriers consisted of lack of time, language problems, lack of trust, low awareness of the value of the knowledge, lack of social networks, and tension in power relationships. At the organisational level, the barriers included: disconnection between knowledge sharing and organisational goals, neglect of managerial communication encouraging the benefits of knowledge sharing, lack of network connections, and competition between teams. The technological barriers comprised: lack of training, lack of time, and a lack of communication concerning the technologies selected. These communications problems are a subset of the knowledge sharing paradigm and are minimally addressed in existing research (García-Morales, 2011).

In the rest of the vast knowledge management research concerning software firms, most of the literature can be categorised into a few topics. These include

literature that focuses on teamwork (Valencia-Garcia et al., 2010); how knowledge management creates a competitive edge (Darroch, 2005; Darroch & McNaughton, 2003); how knowledge management affects technology implementation in an organisation (Mathiassen & Pourkomeylian, 2003); and, how knowledge management aids SMEs in organisational growth (Piva et al., 2013; Shaw & Darroch, 2004; Ubeda et al., 2013).

The transfer of organisational knowledge in software development SMEs—through communication practices—is identified as a consistent communication challenge in web development firms (Heavin & Adam, 2012). In a seminal management article, Hansen, Nohria and Tierney (1999) began delineating the importance of knowledge management for all organisations, particularly knowledge based industries like software development (Adler et al., 2009; Alvesson, 1993; Andriopoulos & Lewis, 2009; Büschgens et al., 2013; García-Morales et al., 2011; Heavin & Adam, 2012; Herbsleb & Moitra, 2001; Jasinski, 2005; Mathiassen & Pourkomeylian, 2003; Odorici & Presutti, 2013). Knowledge management research is significant because knowledge management is an organisational communication management function just as project management is a communication function of management.

Project management. Project management is *the management of a project that creates a unique product or service* (Schwalbe, 2013). It is an understudied area of organisational communication (L.L. Putnam, personal communication, 23 May 2015). Within project management communication is identified as a critical competency skill (Bourne, 2015; Pritchard, 2013). Gillard and Johansen (2004) evince that communication skills are central to the creation and completion of a project; and, a project manager should expect to spend the majority of their time engaging in communicative practices. Communication *gone wrong* creates severe problems for project teams and organisations (Schwalbe, 2013). The industries using project management are diverse and research in project management, outside of the organisational communication discipline, is comprehensive (Bourne, 2015). However, as Lee, Jun-Gi, and Lee (2015) argue, “in the context of information systems (I.S.), communication involves creating and sharing information to raise the level of mutual understanding” (p. 800) among project teams. In other words, the purpose of project management in software development is to create clarity among the high-tech organisational members and the non-technical employees.

As defined by Schwalbe (2013), the communication knowledge area involves the creation, dissemination, and storage of knowledge concerning the project. In the context of information systems project management, Lee, Jun-Gi, and Lee (2015) defined the communication knowledge area differently. In a study of behavioural competencies for project managers, *soft skills, or non-technical skills*, were noted as significant for successful project completion (Dillon & Taylor, 2015; Napier, Keil, & Tan, 2009; Skulmoski & Hartman, 2010). However, while project management communication competencies are central to successful project management completion (see Daim et al., 2012 as an example), communication is considered separate from the project management process (Hoffmann, 2013).

Project management may compartmentalise organisational communication, but CCO gives neither organising nor organisation preference (Cooren et al., 2011; Cooren et al., 2006; Taylor, 2011); it happens simultaneously. Therefore, following the same logic, without communication the project would not exist; it could not be maintained nor completed. In writing for project managers, Dow and Taylor (2008) suggested, “as project managers begin new projects, they step back and look at how they will communicate effectively” (p. 1). They argue proactive communication is a *critical* technique in project management. Communication with multiple parties and multiple channels are part of the overarching behavioural competencies necessary in successful project managers (Loufrani-Fedida & Missonier, 2015). Another key feature of project management is managing the communication and relationship networks.

Networks. In addition to project management, connections with other organisations are critical for small business survival (Badir et al., 2012). These collaborative relationships, their communicative purposes, and their contribution to innovation and organisational development have long been understood (D’Angelo, 2012; Gulati, 1998). As D’Angelo (2012) explained, “firm alliances and strategic networks potentially provide firms with access to information, resources, markets, and technologies” (p. 397). Maintaining these organisational relationships is necessary for high-tech firms and requires refined communication skills (Badir et al., 2012).

The word *network* has several definitions when referring to high-tech firms. In this study, networks are the relational connections in an organisation with other firms or individuals which will benefit the organisation’s success. Gilman and Edwards (2008) assert the importance of networks and evaluate how they affect a

firm's success. They noted that isolation from networks left organisations vulnerable when as they grew. Kushnirovich and Heilbrunn (2013) argued the importance of informal networks, and they suggested that an organisation's formal networks are enhanced by the informal social networks of the organisational members. Johansen and Vahlne (2009) claimed that an organisation is made of social networks and these networks affected the fundamental functioning of the organisation. Implied, yet critical, to their research is that strong networks meant the organisation *must* communicate.

The research in organisational communication and in management support the argument that communication in high-tech SMEs needed evaluation. This chapter section reviewed literature in organisational communication rhetoric, communication management, knowledge management, project management and networks. Each of these topics, as the conclusions were drawn for the data in this research, were intertwined with communication practices and the firms' success. Yet, intertwining these practices can cause communication challenges. These challenges are called organisational tensions.

Organisational Tensions

Organisational tensions are the final focus of this literature review. This section describes tensions as they currently exist in the organizational communication literature. Then, the literature about organisational tensions and high-tech firms is examined.

Dialectical Tensions. Putnam (2015) wrote, "Dialectics centres on the dynamic interplay between two interdependent but opposite poles" (p. 707; also see Mumby, 2005). Organisational tension theory begins with the concept of polarity as represented in Putnam's definition of dialectical tensions. Polarity is the state of opposites which are interdependent. When considered together, the interdependency of the opposites provides additional depth to their complexity and characteristics; for example, light and dark. One cannot know how dark something is without knowing the light to which it can be contrasted, or a knowledge of the brightness of light without contrasting it to darkness. In organisational communication tensions, this interplay between polarities is called dialectical tension. Bakhtin (1984) is said to have founded the dialectical form of tension analysis in the communication discipline (Baxter & Montgomery, 1996). Although dialectical philosophy began with Hegel (2013), Bakhtin's (1993) original work on

multifaceted tensions in dialogue provided early communication examples of polarity.

To understand Bakhtin's concept of tensions, it is helpful to consider his example; that of the two-faced, Roman god Janus (Holquist, 2003). Bakhtin (1993) writes, "An act of our actual experiencing is like the two-faced Janus. It looks in two opposite directions" (p. 2). The two-headed Janus simultaneously looks to the future and the past and is drawn in both directions at once. He, therefore, symbolises polarity and the push-and-pull tensions of opposing interests. Bakhtin argued that tensions were resolved through dialogue and the creation of a shared meaning (Bakhtin, 1993; Holquist, 2003). In other words, communication resolved the tension. As a result, Bakhtin's work was the inspiration for dialectical tension analysis in the communication discipline.

Baxter and Montgomery (1996) used Bakhtin's literary theories to justify their relational dialectics theory, and dialectical work was later assimilated into organisational communication cultural analysis as can be seen in Mumby (2005), Putnam (2004), and Trethewey & Ashcraft (2004). In recent research, and applicable to this thesis, Putnam (2015) used materiality and discourse to explain the way in which dialectics work. She wrote, "I believe that the two phenomena, [discourse and materiality,] are empirically distinct, but mutually implicated; that is, even though they may exist as an invisible whole, researchers need to examine them separately and dialectically to avoid privileging one pole over the other" (Putnam, 2015, p. 706-707).

Organisational tensions in technology. Organisational tensions may result from the sociomaterial aspects of the organisation are the relational aspects of the organisation, and organisational tensions are expected in small and medium high-tech firms (Nunes et al., 2011; Sheep et al., 2016). Some tensions are dialectical tensions; and yet, some tensions place pressure on the whole organisation and cannot be separated into polarities (Chang & Hughes, 2012; Nunes et al., 2013).

In an ethnographic study, Ribes and Finholt (2009) examined research and development (R&D) projects. They noticed unusual tensions in the firms such as inclusion versus readiness – which referred to the implementation of a technology project in a specific geographic location. From their findings, they noted that when it was time to implement the project in a small community, the community was unprepared for the high-tech project implementation.

Following Ribes and Finholt's example, Kee and Browning (2010) conducted a dialectical analysis of a high-tech organisation. The analysis centred on the important issue of funding, and found that tensions emerged on institutional, individual (employees of the organisation), and ideological levels. In their research, Kee and Browning (2010) noted five dialectical tensions resulting from the *social myths* in the organisational culture. An example was the belief that the United States National Science Foundation (NSF) could not fund both technology projects and science projects due to limited resources. However, this tension of beliefs, and others like it, proved to be false. Of relevance to this thesis is that Kee and Browning (2010) noted the importance of communication in the process of negotiating each of the tensions.

The process of negotiating tensions was also identified by Baker and Lu (2015). They noted how the large high-tech company, Google, used organisational tensions to benefit their position in China. Google strategically balanced their organisational tensions by highlighting their commitment to the Chinese community. Their research focused on three tensions. The first tension was business versus ethics. They noted that Google China was caught between ethical responsibility and economic responsibility. The second tension was global standards versus local compliance, and the third tension was corporate control versus state control. While Google was interested in providing the Chinese nationals a global experience; eventually they complied with the local laws. However, it did take time and experience for Google to balance their approach with their Chinese customers. Initially Google had conflicting interests in the Chinese context. However, they did reconcile these tensions and still operate in China. Tensions have also been researched in other disciplines studying high-tech organisations.

Tensions can be heightened depending on the firm's age (Chang & Hughes, 2012; Heavin & Adam, 2012; Nunes et al., 2013); and, further tensions emerge depending on the experience of the entrepreneur; whether the entrepreneur is experienced or a novice determined the underlying tensions in the organisation (Odorici & Presutti, 2013). The only way to resolve these issues is through the development of experience, cooperation, and communication (Badir et al., 2012; Barnard, 1968; García-Morales et al., 2011; Henderson, 2004; Odorici & Presutti, 2013; Russell, 1997). In other words, organisational growth and communication is part of the reconciliation of the tensions experienced in high-tech SMEs (Fairhurst & Putnam, 2004; Leonardi & Jackson, 2004). In summary, organisational tensions

in high-tech firms are a communication concern and part of organisational growth. Some of these tensions are enabled by the interdependence between the human actors and the technology that comprise small and medium high-tech firms.

Conclusion

The literature review was comprised of four sections. The first section of the literature outlined the history and definition of organisational communication. The second section discussed CCO as a theory in organisational communication; and, that section of the literature review also focused on the primary approaches to CCO. The third section of the literature review considered materiality, sociomateriality, and the current trends in organisational tensions. The fourth and final section of the literature review highlighted research in communication written about high-tech firms. Also, worth noting in this conclusion is the absence of literature on high-tech implementation in an organisation. Research on high-tech implementations in organisations is comprehensive and important; however, the topic was not relevant to this research project.

Several points in the literature review are notable. First, the organisation-as-a-machine metaphor has been long retired and was replaced by a more human-centred approach to management and organisational research (Taylor & van Every, 2014). Second, the traditional conceptualisation of high-tech firms' organisational cultures are perceived as *almost* *laisse fair* (Büschgens et al., 2013; see the seminal research of Kelly, 1985; J. K. Larsen & Rogers, 1985; Sprague & Ruud, 1988). Third, as CCO has developed, many organisational communication studies have referenced CCO as their theoretical orientation (Aten & Thomas, 2016; Constantinides, 2013; Dobusch & Schoeneborn, 2015; Güney & Cresswell, 2012; Koschmann, 2013; Schoeneborn & Trittin, 2013; Vásquez & Cooren, 2013; Vásquez, Sergi, & Cordelier, 2013). However, few studies have evaluated CCO with the whole organisation as the primary actor (Brummans, 2017; Koschmann, 2017; Vásquez & Schoeneborn, 2017). Fourth, organisational tensions, from an organisational communication perspective, and their application to high-tech firms needs to be re-evaluated (Sheep et al., 2016). Fifth, and finally, there is limited literature about project management, knowledge management, or small and medium web development firms *from an organisational communication perspective*.

Given the gaps in the research literature, I focused on two research problems. The first focus concerned the lack of research in the organisational communication discipline on high-tech SMEs. From the literature, it was implied

that high-tech SMEs must function like large high-tech firms. However, from the management literature on SMEs, it was evident that small and medium sized firms deal with significantly different challenges. This is a research problem because the majority of high-tech firms are SMEs, and according to the OECD (2015), they are the fastest growing industries in developed economies.

The second research focus was an attempt to connect CCO to the context of a firm, instead of centring the research on several practitioners within one firm. What I mean by this is: if there are communication problems in high-tech SMEs, could applying CCO a theoretical framework assist the practitioners to better understand their communication challenges? It should be mentioned that in 2014, when I began the bulk of my research, CCO was being use a philosophical framework for organisational communication; yet, using the framework as a map for practitioners to improve their organisations had not been attempted.

In summary, the research problem was the whole -firm application of CCO and the lack of research in high-tech SMEs in the organisational communication disciplines. This is a research problem because high-tech SMEs comprise the majority of high-tech firms and are one of the fastest growing industries in developed economies. In the next chapter, the methodology for this doctoral research is explained. I include in that chapter the research questions are identified, along with the methods used to undertake the research.

Chapter Four: Methodology

In the previous chapter, literature in organisational communication, CCO, and pertinent research about high-tech organisations was reviewed. Having reviewed that literature, I identified several research opportunities. First, there are insights to be gained from undertaking a communicative study of small and medium-sized web development firms. Second, a grounded theory approach to organisational communication combined with CCO (Charmaz, 2014; Corbin & Strauss, 2014; Glaser & Strauss, 1967) provides an opportunity to inductively assess if, how communication occurs in high-tech SMEs, supports CCO theory (Koschmann, 2017). Third, and finally, there is value in exploring the communication tensions of web development SMEs – a type of organisation we know comparatively little about in organisational communication, but which plays a significant role in the 21st century economy. Hence, the research questions for this study were as follows:

Primary Research Question: What are the major communication challenges and issues in small and medium web development firms?

Supporting research questions:

- 1) During what transitional moments in these organisations do communication practices become a priority?
- 2) What are the underlying assumptions about communication? What challenges do these underlying assumptions cause?
- 3) What strategies are being used to solve the communication challenges which do occur?
- 4) What insights does CCO, as a framework, provide practitioners?

This chapter presents the methodology and methods employed to answer the research questions. In the methodology section which follows, qualitative research is defined and discussed as a research approach for organisational communication. This section also explains other organisational communication qualitative approaches and outline why grounded theory method (GTM) was chosen for this research. This will be followed by a history of GTM with examples of how the coding process was applied to the data for this project.

Methodology

In organisational communication research, qualitative researchers may adopt one of two approaches: inductive or deductive. Inductive research means the researcher develops theoretical claims by collecting data and analysing it from the ground up. Alternatively, the researcher may take a deductive approach, wherein,

the researcher examines the research questions with the intent to validate presuppositions or existing theories (Tracy & Geist-Martin, 2014). Tracy and Geist-Martin (2014) explain that, in organisational communication, qualitative research options can be categorised into distinct methodologies.

Organisational communication methodologies. Early research trends in organisational communication were ethnographic and followed the sociological patterns for studying culture (Trujillo, 2001; see Keyton, 2014 for additional details and history). After ethnographic research practices were applied to organisational communication research, researchers began to branch into other areas of organisational studies. They began to examine power and leadership applying critical theory to organisational practices (Putnam & Mumby, 2014a). Simultaneously, discourse and narrative studies were increasingly used in qualitative studies to reveal the symbolic nature of organisations (Boje, 2001; Fairhurst & Putnam, 2014; Lindlof & Taylor, 2010; Taylor & van Every, 2000). Discourse analysis researchers explore the role played by language in organisations (Fairhurst & Putnam, 2014; Putnam, 2004; Putnam & Fairhurst, 2001), and assess how meaning is constructed through speech acts, interaction analysis, semiotics, rhetorical analysis, critical language studies, and/or postmodern discourse analysis (Fairhurst & Putnam, 2014). Within discourse analysis studies, another common analytical approach was dialectical tension analysis (Mumby, 2005; Putnam, 2004).

In the evaluation of discourse, organisational relationships emerged as important and worthy of additional exploration, which led to the analysis of networks and relational assessments within organisations. Monge and Contractor (2003) explain network analysis: “Communication networks are patterns of contact that are created by the flow of messages among communicators through time and space” (Monge & Contractor, 2003, p. 3). Examining networks reveals the communication flow of non-human objects as well as human conversation. An example of human and non-human actors working together is using a computer to send an email to a colleague that suggested improvements for interaction (Cooren, 2006; Latour, 2005), or using an emoji in a work email (Bazzaz, 2016). Ethnographies, network analyses, and discourse analyses are three of several methodologies used to study organisations (Putnam, 2014b). While these approaches were considered for this research, the grounded theory method was chosen because the evaluation of CCO in the firms needed to come from a practitioner perspective. This alternative approach to evaluating and collecting

organisational communication data aligns with other trends in organisational communication research.

Tracy and Geist-Martin (2014) analysed 241 journal articles and abstracts between the years 1996 and 2011. I have included their evaluation to provide context for the use of grounded theory method (GTM) in the organisational communication discipline. They evaluated the common methodologies used in organisational communication research. Their findings are divided into three areas of focus: context, themes and contributions. The most common research *contexts* included studies centred on niche demographics, such as workers caring for ailing parents and non-profits, education and professional science organisations and technical services. Health communication, health care practitioners' and that of their associated organisational practices were also frequently studied. Among the *themes*, the most commonly identified concerns were employee and organisational identity. Among the specific *methods* assessed by Tracy and Geist-Martin (2014), the bulk of the research used discourse analysis and ethnographic methods.

Tracy and Geist-Martin (2014) wrote of organisational communication research trends, but they also noticed research opportunities. They asserted that *assimilation* and *voice* were the primary topics that needed additional research. Assimilation is the way in which organisational members negotiate organisational change and their organisational roles (Putnam & Mumby, 2014a). Just as assimilation is concerned with organisational change and negotiation, the voice is concerned with evaluating diverse experiences and perspectives within the organisation (Budd et al., 2010). In research on organisations *and* technology, Rice and Leonardi (2014) noticed similar gaps in the research. They wrote of 13 research themes in ICT and organisational communication: "influence, interaction, knowledge, level of analysis, problems, process, research, structure, technology and outcomes" (p. 442). They also suggested additional studies in technology, organisations, and communication flow. In other words, like Tracy and Geist-Martin (2014), Rice and Leonardi (2014) were interested in organisational members and how they assimilate to the organisational flow when technology is concerned.

Tracy and Geist-Martin (2014) also anticipated a shift in analysis and presentation of organisational research. "New and innovative approaches to the study of organisational studies include representation of the findings in unique forms, such as problem-solving, brief white papers, website development and poetry" (p. 260). This follows Putnam and Mumby's (2014) assertion that additional

methodologies in organisational communication are materialising and leading to new knowledge and perspectives on organisational life. In Lindlof and Taylor's (2010) analysis of methodologies in organisational communication, and Tracy and Geist-Martin's (2014) review, GTM is not mentioned as a common approach for organisational communication scholars. These authors were also silent about this research method.

GTM has been used in organisational communication research in the past. The most prominent grounded theory researchers in organisational communication and technology were Browning and colleagues (Browning, 1978; Browning, Beyer, & Shetler, 1995; Kee & Browning, 2010). In their research projects, grounded theory was chosen as the primary research method, allowing the researchers to fully grasp the voice of the participants, their experience with technology, and the technological advances in their organisations. Choosing GTM provided a bottom-up approach wherein the data would guide the evolution of the research (Charmaz, 2014). Following their precedence, this thesis has taken a similar approach to high-tech firms.

Conversely, organisational discourse research, in its various forms (Fairhurst & Putnam, 2014), takes a top-down, *deductive* research approach, meaning, the raw data is analysed from the perspective of current theory, or the researcher looks for specific components in the data as related to established theoretical perspectives or terminology. For example, if using critical discourse analysis, the researcher would take a set of raw data from interviews or other artefacts and analyse it according to the interplay of power and struggle within the relationships and the organisational structure. In contrast, ethnography requires a researcher to immerse him/herself in the experiences s/he is researching and is an *inductive* approach. In contrast, GTM strongly asserts that the researcher *must* understand the data from the bottom-up. This inductive approach is designed to reveal the voice of the research participants—which has been previously lacking in organisational communication (Tracy & Geist-Martin, 2014). GTM also provided an opportunity to understand a research topic intimately, like ethnography, but without requiring the researcher to immerse him/herself in the environment. Instead, the researcher immerses him/herself in the data and the experience of the participants.

GTM provided an alternative perspective as Tracy and Geist-Martin (2014) encouraged, and as Putnam and Mumby (2014) suggested, was needed for the multidisciplinary research emerging from the discipline. Moreover, as Taylor

(2011) observed, organisational communication research methods need to be as dynamic as the ever-changing organisational climates in which the research is occurring. Taylor's (2011) point is further validated as technology practices are imbricated into organisational life (Orlikowski, 2010), and because technology and organising are deeply intertwined (Rice & Leonardi, 2014). Therefore, research contexts of technology and organisations with their layered complexities and processes become ideal subjects for GTM research (Urquhart, 2007, 2012).

Analysis of the complexities of technology companies using GTM research has been explored in organisational communication. Browning (1978) interwove the study of organisational communication, grounded theory, and technology early in his career. The pattern of using GTM in organisational communication and technology studies intersected in several studies (see examples: Browning, Beyer, & Shetler, 1995; Kee & Browning, 2010; Mills, 2009). These studies provided the precedence for using GTM under the contexts outlined in this thesis. Consequently, a brief history and explanation of GTM practices is given to provide context and clarity for the reader.

GTM Methodology and Method

This section provides a rationale for the use of GTM in organisational communication studies. It also explains the GTM process and some theoretical underpinnings. As Corbin (2014) writes, a methodology is an explanation for the reader about how the researcher arrived at her/his conclusions through the collected data. Accordingly, the methodology section of the chapter consists of three parts: a brief history of GTM, outlining the different approaches to grounded theory; a thorough discussion of the grounded theory approach used in this research; and, a concluding discussion about incorporating organisational tension analysis with GTM. The tension analysis discussion interweaves the traditional organisational communication methodologies and GTM. Also, this analysis was a direct result of the research process and is discussed in the contextual findings chapter (Glaser & Strauss, 1967). Also included in this section of the chapter are examples of the coding process as recommended by GTM scholars.

A brief history of GTM. In 1967, Glaser and Strauss published *The Discovery of Grounded Theory* as a result of the research being conducted on death and dying at the University of California, San Francisco. The purpose of GTM was to provide an alternative research technique beyond the *top-down* positivist research method of the time (Charmaz, 2014; Corbin & Strauss, 2014; Morse et al., 2009).

Their concern was that research participants were not being given *voice* in the literature. They wanted to allow the participants and contexts to present the data without the researcher conceptually separating the emerging concepts from the experience of the participants. They felt researchers were separating the data from the experience by forcing the researcher's objectives onto the data. Thus, they expected to provide a path that would allow a researcher to develop theory from the *ground-up* by acting as a voice for the participants and their contextual experiences (Glaser & Strauss, 1967; Morse et al., 2009). After the publication of this book, Glaser and Strauss philosophically parted ways regarding their positions on how grounded theory should be undertaken, even though they both maintained their original argument about the need for ground-up, qualitative theory development.

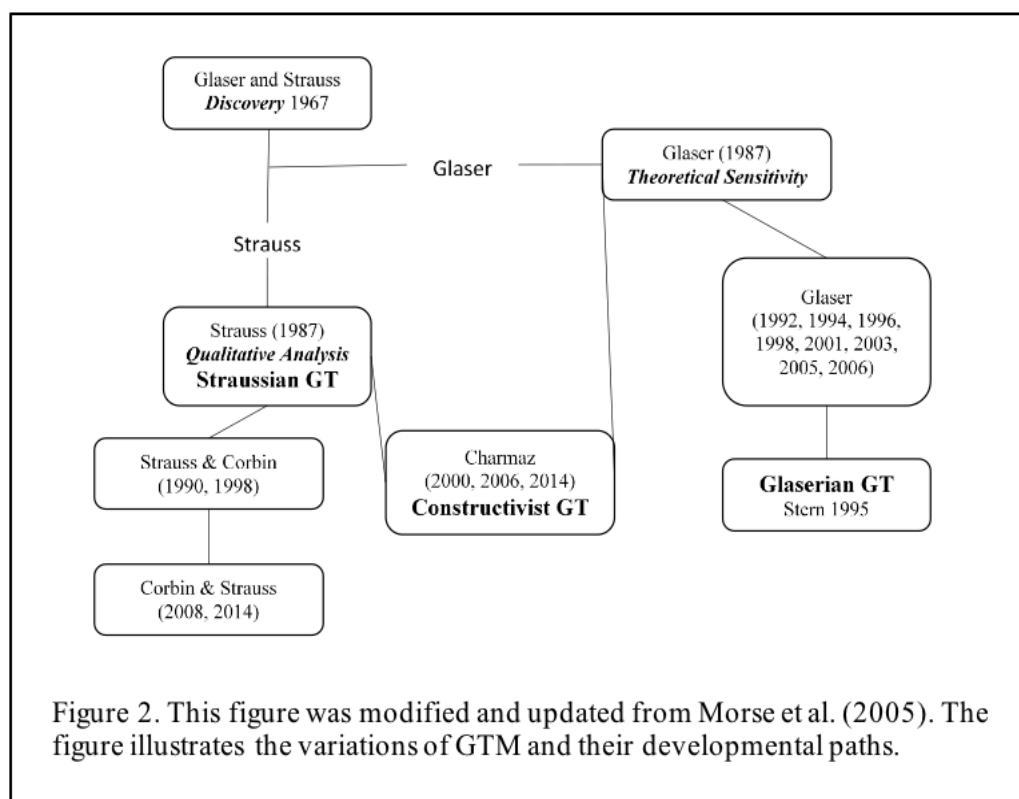
In the development of *Discovering Grounded Theory*, Glaser and Strauss (1967) relied heavily on their philosophical and theoretical training. Applying the work of Blumer (1969), Dewey (Corbin & Strauss, 2008) and other pragmatists, symbolic interactionism was encouraged and nurtured by Strauss (Corbin & Strauss, 2008; Morse et al., 2009). In contrast, Glaser encouraged GTM from an interpretive, yet positivist, paradigm (Birks & Mills, 2011; Charmaz, 2014). Positivism claims the researcher is objective (Urquhart, 2013, p. 59). In contrast, pragmatists believed the researcher created joint-meaning with the research participants (Charmaz, 2003). As Bryant and Charmaz (2010) explained, "Glaser and Strauss came from very different backgrounds, and their specific trajectories certainly exerted profound influences both on their early statements and examples of GTM, and on their later divergence" (p. 6). The research differences of Glaser (positivist training) and Strauss (pragmatist training) led to divisions among GTM researchers about how to appropriately conduct theory development and with what, if any, research paradigms (Morse et al., 2009).

According to Glaser (1978), the purpose of GTM was to examine social processes with the intent of theory development. For Strauss, and later Corbin (2008), the purpose of GTM could be multifaceted. For them, GTM may be employed for thick description, to research an organisational or social process, or to theorise from a symbolic interactionist and pragmatist perspective. Glaser (1978), Corbin and Strauss (2008) aligned when they suggested that grounded theory's purpose was to *examine social processes* beginning with a broad research problem (Morse et al., 2009). At this juncture, it must be noted that Corbin was a student of Strauss's and later worked with him on *The Basics of Qualitative Research* for the

sake of graduate students (Corbin, 2014). Charmaz (2014), author of *Constructing Grounded Theory* (CGTM) and a student of Glaser and Strauss, encouraged grounded theory use to decipher the meanings and realities of the subjects and phenomena under study. Her approach was designed to combine the best of Strauss and Glaser's work.

What's the difference? Glaser, Strauss and beyond. For the sake of clarification, Table 4 below presents the differences and similarities among prominent GTM theorists. There are other thematic analyses which claim grounded theory but which are not grounded theory (Urquhart, 2011). Therefore, it is important to identify the primary grounded theory guides as identified by Glaser, Strauss and his co-author Corbin, and Charmaz. Each approach to GTM provided a similar, yet different version of the grounded theory process (Kelle, 2010). To elucidate how GTM was used in this research and to expound on the associated methodology, the methods and methodology must be situated against other GTM possibilities. Further delineations of these differences are presented below in Figure 2 (page 80) and Table 4 (page 81).

Figure 2. The Development of Grounded Theory Method



There are several differences among the approaches to GTM and a few differences that are practical, such as when it is appropriate to conduct the literature review and which method aligns best with which inquiry paradigm. Yet, some differences are a matter of definition, such as coding the data, which closely parallel each other. Another difference is the way in which they recommend how to most accurately draw-out the practitioners' experiences and voice from the data (Charmaz, 2014; Corbin & Strauss, 2014; Gibbs, 2015; Glaser, 1978). The final noteworthy difference is the criterion by which each methodology delineated the definition of a *theory*.

Table 4. Comparing GTM Approaches

<i>Comparing GTM Methodological Approaches</i>			
	Glaserian GT	Straussian GT	Constructivist GT
Primary Author(s)	Barney Glaser	Anselm Strauss Juliet Corbin	Kathy Charmaz
Inquiry Paradigm	Positivism, Hermeneutics, Pragmatism (Åge, 2011) Glaser claims a neutral inquiry paradigm	Pragmatism, Social Interactionism (Bryant & Charmaz, 2010)	Constructivism (Bryant & Charmaz, 2010)
Primary Research Aim	Develop theory and concepts on the general research problems (Glaser, 1978)	Discover meanings and experiences of participants; used for description or theory building (Corbin & Strauss, 2008)	An interpretive understanding of subjects' meanings and experiences (Mather, 2008)
Role of Literature Review	Use literature as data after data collection; interweave literature with 'discovered' theory (Niekerk & Roode, 2009)	Descriptive literature is read at the beginning to inform research questions; delay in-depth literature review Niekerk & Roode, 2009)	Focused literature review interweaved throughout the study; conventional use of thesis or publication guidelines (Charmaz, 2014)
Emergence vs Verification	Data supersedes all other information; if it is not in the data, it should not be included in the research (Niekerk & Roode, 2009)	The researcher questions and verifies the data with the codes and external literature (Niekerk & Roode, 2009)	Agrees with Glaser (Charmaz, 2014)
Criteria for Judging the Theory	<ul style="list-style-type: none"> • Fit • Work • Relevance • Modifiability (see Glaser, 1978, for definitions)	Corbin and Strauss (2008) recommends three complex phases (see their book for more detail)	<ul style="list-style-type: none"> • Credibility • Originality • Resonance • Usefulness (see Charmaz, 2014, for definitions)

Combining GTM approaches. Urquhart (2013) argued that a GTM researcher may use any of the approaches suggested here or may use a combination of the approaches depending on the needs of the data, the research questions, and the epistemological and ontological paradigms of the researcher. While CGTM promoted a social constructionist perspective, Charmaz (2014) explained that GTM is a container into which any research paradigm may be poured. Strauss and Corbin (1998) claimed grounded theory was ontologically and epistemologically neutral.

Both approaches are contrasted with CGTM (Charmaz, 2014).

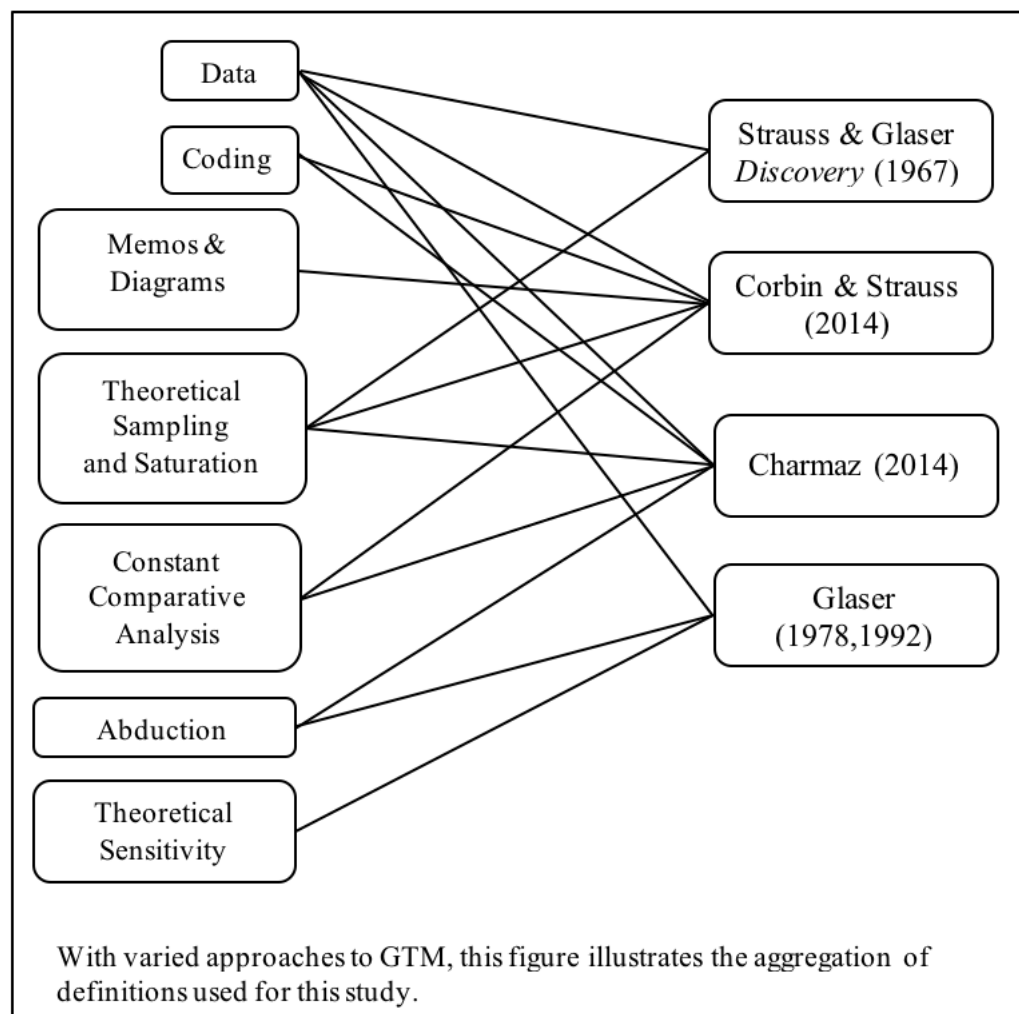
“Ontologically relativist and epistemologically subjectivist, constructivist grounded theory reshape the interaction between researcher and participants in the research process” (Mills, Bonner, & Francis, 2006, p. 31). Central to CGTM is the notion that the researcher is biased and intertwined with the research experience (Bryant & Charmaz, 2011). CGTM acknowledged the researcher’s inherent choices when conducting a study, thereby framing the research conclusions to the standpoints of the researcher (Bryant & Charmaz, 2011). While Corbin and Strauss (2008) did not explicitly account for researcher bias (Bryant & Charmaz, 2011), Corbin (2014) later wrote that researcher bias was explicit in the methodology of pragmatism to which GTM aligns. Understandably then, GTM has been used with many different research paradigms and may be understood differently by those who employ the method and those who write about it (Suddaby, 2006).

Corbin (2014), and as a constructivist, Charmaz (2014), accounted for standpoints and research bias (Gibbs, 2015). The process of research, according to Charmaz (2014), is operated in the language of symbolic interaction, the theoretical forbearer of pragmatism, through the voice of the participants. Corbin (2014) argued a similar approach when she claimed that the pragmatists were the forefathers of the social constructionists. Knowingly, Corbin (2014) and Charmaz (2014) restated the central issue; that is, the researcher and research participants co-create a shared experience during the research process. Therefore, the co-creative nature of symbolic interactionism has evolved through the pragmatist and constructivist research eras parallel to GTM. As a result, GTM fits well with organisational communication research; particularly, it works well as a method for research aligned with the *communicative constitution of organisations* perspective where shared symbolic interactions and language are a central issue in communication events (Cooren et al., 2011; Putnam & Nicotera, 2009; Taylor & van Every, 2000). Furthermore, GTM also aligned with the need for organisational research, which

included more participant voice (Tracy & Geist-Martin, 2014). As a result, the intent for using GTM in this research was to allow for the fluid inductive development of a substantive theory of communication in web development firms.

Therefore, this research project does not solely refer to Charmaz's, Corbin's or Strauss's work. Instead, the approaches were synthesised and adapted—as long as they aligned with the constructivist epistemology and ontology set forth by Charmaz (2014). The coding process, in terminology, in this study was drawn from CGTM. Charmaz (2014) provided a coding pattern which dealt with language, and nuanced communication approaches that aligned with the discursive turn of organisational communication (Denzin & Lincoln, 2013; Putnam & Mumby, 2014a). Also, CGTM accounted for the language conflicts evident in the data as the research progressed. Additionally, the grounded theory connection to pragmatist philosophies provides a grounding point for using GTM in an organisational communication study since the Montreal School's version of CCO is also grounded in pragmatism.

GTM coding process. Having established the theoretical underpinnings of GTM, the process of GTM is best explained by presenting a series of operative terms commonly used in grounded theory studies. While there are some intersection with qualitative research generally, some of the definitions are nuanced by GTM and the analysis patterns are unique. In Figure 3, I provide these terms to introduce the reader to the basics of GTM procedure, and establish shared meaning concerning the research logic and process. Because I drew on several GTM scholars, the diagram below explains the sources of the definitions of the terms which I blended for this research project. Therefore, the rest of this chapter section interweaves definitions with the method whereby this research was conducted demonstrating the organic quality of GTM.

Figure 3. Definitions of GTM by Theorist

Data collection. Grounded theory begins when data is collected from the field of study (Charmaz, 2014). Data may be collected from interviews, observations, and artefacts about the topic (Corbin & Strauss, 2008). Several qualitative data collection approaches may be used in GTM: observations for description and context (Clarke, 2005); ethnographies for immersed experiences with the research participants (Charmaz, 2014); interviews with participants (Charmaz, 2014; Glaser & Strauss, 1967); or, publicly assessable artefacts (Corbin & Strauss, 2014). Charmaz (2014), Corbin & Strauss (2014), and Strauss and Glaser (1967) recommend interviewing as a primary source of data collection once the broad research questions are established. The purpose for using broad research questions aligned with the logic of why interviews are used in GTM. “We interview people to find out from them those things we cannot observe and to understand what we have observed” (Patton, 2014, p. 426). Neither the research questions nor the interviewing structure should constrain the participant, the participant should be allowed to speak about his/her experience openly.

In this research, data collection began once ethics approval was granted. I applied for ethics approval from the University of Waikato, Management School Ethics Committee with the anticipation of using observations and semi-structured interviews as data collection methods. The ethics application also detailed the intended research participants (small and medium web development firm organisational members); the research questions; an outline of GTM; and, the anticipated duration of the research. As part of the ethics approval, it was determined that the names of organisation and individuals would be changed to protect participants' identities and to support them to be open in the interviews without fear of risking their individual or organisational reputations.

Selection of participants. After receiving ethics approval, participant selection began by identifying firms that fit the criteria of being a small web development firm, as outlined in the background chapter. The first group of participants chosen were small firm owners with the anticipation that they would give an overview of the firms' communication flow as well as their communication constraints. Understanding the small firms' communication flow would provide insight into the communication challenges by revealing the intersections of when communication became a priority for them. Small firm owners were also chosen because they have a vested interest in the success of the firm. Initially, I recruited participants in the *Silicon Slopes* region of Utah, United States. According to GTM, when categorical saturation has been researched—that is, no new information is decipherable by the researcher from the participants—additional theoretical sampling is encouraged (Charmaz, 2014). Additional theoretical sampling refers to collecting additional data about the same topic from a different source. For instance, instead of interviewing the small firm owner, I would also interview the marketing manager or their human resource specialist.

Data collection began by interviewing two small business owners, Jack and Grace. They lived in Utah while I was in New Zealand, so the interview happened over Google Hangouts. Interviewing by video conferencing would be a recurring theme. The audio of the interview was recorded, and I made notes while they answered the semi-structured interview questions I presented to them (see Appendix A). After the interview was over, I wrote up a memo of my notes from the interview.

To gather more data, I returned to Utah. Since I had moved to a city where I had a small professional network, I searched Google for web development firms in

Salt Lake City, Utah, and began calling firm owners to evaluate their interest in participating in the research. As an incentive, I offered an organisational communication audit with a report highlighting areas to improve their organisations based on the interviews and observations I had gained in their organisations. Of the 15 small web development firms I called, only three firms consented to participate. None of the firm owners were interested in the communication audit offer; they were more interested in networking and being altruistic to a student. After I interviewed three of the firm owners, I transcribed and coded the interviews. Once the interviews were transcribed and coded I began comparing them to the first two interviews I conducted. The comparative process was done through memoing, or writing out observations and notes in a diary-type format. By the end of the project, I had interviewed 12 small firm owners. The seven additional interviews with small firm owners were a result of attending the Silicon Slopes Conference in Salt Lake City in 2014 where networking and referrals benefited my ability to attract additional participants.

Interviewing. Interviewing allowed me to understand the perspective of the research participants (Charmaz, 2014; Glaser & Strauss, 1967; Patton, 2014). As Perakyla and Ruusuvouri (2011) write:

Most qualitative research is based on interviews. There are good reasons for this. By using interviews, the researcher can reach areas of reality that would otherwise remain inaccessible such as people's subjective experiences and attitudes. The interview is also a very convenient way of overcoming distance both in time and space (p. 529)

This quote summaries the importance of interviews given that research participants, historically, have not been considered as “important sources of knowledge about their own experience,” (Gubrium & Holstein, 2002, p. 4). However, with the post-modern turn of organisational studies, the individual became central to understanding the organisation (Denzin & Lincoln, 2005; Foucault, Martin, Gutman, & Hutton, 1988; Gubrium & Holstein, 2002).

Consistent with the other varying methods and objectives of qualitative research, focusing on an individual's experience in GTM provides subtle and rich insights (Gubrium & Holstein, 2002). Interviews may be undertaken face-to-face or by using video conferencing software, such as Skype. Also, they can be with individuals in groups (Fontana & Frey, 1994; Green, 2013; Krueger & Casey, 2014). Group or individual interviews may take on several forms: structured, semi-structured, or unstructured (Fontana & Frey, 1994). Interviews in grounded theory

are intentionally semi-structured, allowing the interviewer to explore areas which are important to the interviewee but which may not have been anticipated by the researcher when writing the interviewing questions (Charmaz, 2014).

The individuals participating in these interviews were chief information officers (CIOs), project managers, HR representatives, technical writers and marketing managers in web development firms. Conducting interviews provided the most feasible avenue to collect the type of data required by the research questions: to determine the communication challenges of small and medium-sized web development firms, and to provide a diversity of experience, known as theoretical sampling in GTM (Charmaz, 2014; Glaser & Strauss, 1967). Therefore, individuals from several organisational roles were interviewed. It also provided insights about which communication challenges specific to each organisational role.

For the individual interviews, I needed to create a climate where the interviewees could “respond comfortably, accurately, and honestly” to the questions (Patton, 2014, p. 427). Using technology as a resource when interviewing gives the participants greater flexibility. Skype interviews, for example, allowed the interviewee to remain in a comfortable location to support full disclosure during the interview process (Peters & Halcomb, 2015). In all of the interviews, I allowed the participant to be the expert, guiding them with open-ended questions that I created under the guidance of CGTM (Charmaz, 2014).

For this research study, 12 interviews were conducted face-to-face, and 19 interviews were conducted using Skype or Google Hangouts. Table 5 below details the number of interviews conducted and the interviewees’ organisational roles. Unfortunately, one face-to-face interview was discarded because the participant kept speaking of communication issues and challenges for female software developers in a way that was not related to the current research questions; therefore, that interview is not included in the totals detailed in the table.

Table 5. Interview Participants

<i>Number of Participants by Organisational Role and Interview Modality</i>			
Organisational role	No. of participants	Interview Modality	
		F2F	WC
Small Firm Owner	12	6	6
Project Manager	7		7
Software Engineer or Developer	4	4 F2F Group Interview	
Marketing Manager	3	1	2
Chief Information Officer	3		3
HR Representative	2	1	1
Software Technical Writer	1	1	
Total participants	32	13	19
<i>F2F represents face-to-face interviews held in their firms; WC represents web conference interviews conducted through Skype or Google Hangouts.</i>			

Besides interviewing face-to-face, group interviews were also used. Group interviews proceed by gathering a small group of individuals to respond to the research questions. The terms *group interviews* and *focus group* are often used interchangeably (see Collier, 2005), yet they have nuanced differences in their modality. While focus groups typically imply market research, focus groups have also come to refer to group interviews (Krueger & Casey, 2014). A group interview, or focus group, present as two or more persons gathered for data collection in order to provide multiple perspectives concerning a common topic (Krueger & Casey, 2014; Stewart & Shamdasani, 2014). A group interview is intended to collect information from a group of people—while acknowledging the group dynamic—it is not intended to assess the opinions in a social setting (Borgardus, 1926 as cited in Stewart & Shamdasani, 2014, p. 5). When gathering data for depth and breadth, group interviews allow individuals to synergistically disclose more information about the topic in question (Krueger & Casey, 2014)

Interviews provide descriptions of the participants' experiences where the researcher and participant interpret the meaning for the researcher during the interview through their shared experiences. This process highlights the *interpretivist approach* to the research (Charmaz, 2014; Denzin & Lincoln, 2005). Furthermore, interviews permitted the researcher to describe the experiences of the participants from their own words (Green, 2013). Using participants' words created a trail of

evidence that the research was *grounded* in the data, yet is not a “presentation of the raw data” (Suddaby, 2006, p. 635). Interviewing, then, supports the theory development process of GTM from the participants’ perspective instead of from the perspective of the researcher. Alternatively, and in most cases, the theory is created from the combined experience of the participant and researcher (Bryant & Charmaz, 2011). Additional data may be collected from artefacts or observations detailed through field notes (Corbin & Strauss, 2008).

Memos and Diagrams. In GTM data collection phases and coding processes are synthesised by writing memos, or field notes, and creating diagrams. Memo writing is a key component of GTM and is critical for the interpretative process of the data (Charmaz, 2014). Strauss and Corbin (1998) defined memos as “written records that contain the products of analysis or directions for the analyst” (p.217). A memo may contain a series of thoughts and observations about the data, such as noting and evaluating the nonverbal behaviour of the interviewee in connection to their dialogue. On occasion, memo writing may be a diagram of relationships among evolving concepts, codes, and categories (Strauss & Corbin, 1998). *Theoretical coding*, the analysis points when relationships of the categories are explored, is best done through the work of memos. Therefore, memos and diagrams are central to data analysis and assist the researcher in abduction, the unique logical synthetisation (Birks & Mills, 2011). Figure 4 provides a sample memo of the observations I made during a meeting in a medium-sized web development firm. As the memo demonstrates, memos are written observations and analyses of those observations.

Figure 4. Example Memo

This monthly WebEx meeting was for all employees of company X. The top leaders in this newly formed company gave an accountability report for goals set and obtained. My first observation is that there is no “person” on the WebEx screen. As is typical with webinars, there was a question answer box, but it was never encouraged by the leadership to be used.

The information in the meeting was presented in an asymmetrical pattern; the leaders talked, the employees listened--dialogue and discussion was not invited, mentioned, or encouraged. There could be several reasons for this approach, but none of the myriad of reasons were clear during the meeting.

After listening for a while, several assumptions on the part of the leadership in the organization began to emerge. First, they assume everyone cares or should care about what they are discussing. Second, they were using trendy catch phrases, yet their objective, goals and presentation did not reflect the phrases they were using. For example, one of the VPs dictated goals and some strategic management approaches and then called them organic...which was clear that these processes were being given from the top down and were not an organic experience at all. Third, there was an assumption that everyone is convinced by the vision of the CEO and is willing to forgo their own experience and take on the organizational culture that is being forced on them by the leadership through meetings like this and other trainings.

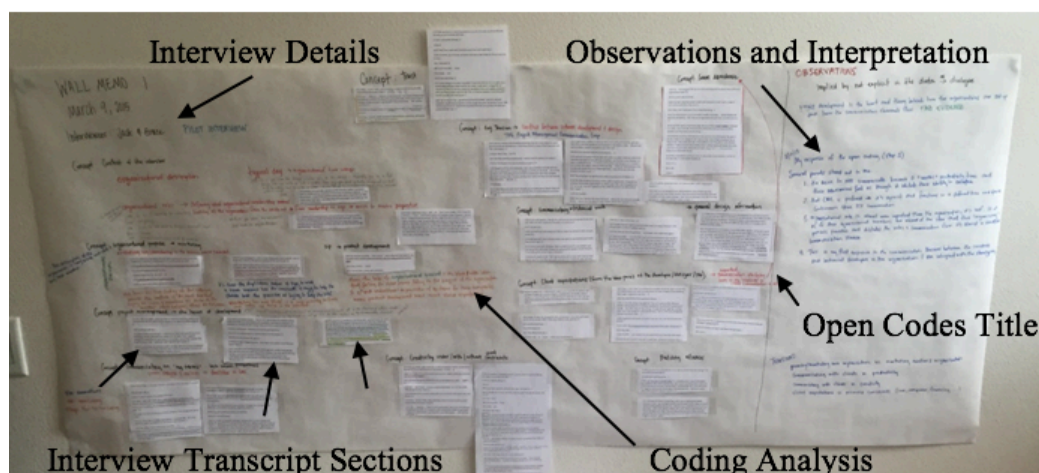
While this is a web development firm, very little was mentioned about the developers. The business side: sales, marketing and rebranding were talked about over and over and over again, but the development side—the website products (what they are actually selling)—was mentioned in only 15% or less of the meeting. It was clear the business people and “business” issues dominated the presentation of the meeting.
(Reynolds-Sheffer, 2015, March 30)

Memos, diagrams and coding from the project. Once the interview transcripts were complete, I began analysing the interview transcripts against each other. This process began with an initial read-through of the interviews and was conducted to detect overarching themes for theoretical sensitivity (Glaser, 1978). This was important for coding and theoretical development. Also, this process helped determine which groups of people needed to be interviewed next to provide a holistic picture of the firms’ communication practices to answer the research questions (Dey, 1999). After the initial thematic read-through, micro-coding, or line-by-line coding, was completed (Corbin & Strauss, 2014).

Micro-coding occurred in two forms for this project: in NVivo—a qualitative coding software—and through wall memos. The transcripts were uploaded to NVivo. This allowed me to micro-code all of the transcripts. For this research, micro-coding was also done by combining memo writing and diagramming into a visual analysis I called the wall memo. Drawing the connections among the data in GTM often occurs through creating memos and diagrams (Corbin, 2014). Wall memos provided an opportunity to explore ideas and make connections through analytical writing and visual representation (Charmaz, 2014; Corbin & Strauss, 2014). Memos and diagrams are the “rudimentary

representations of thought and grow in complexity, density, clarity, and accuracy as the research progresses” (Corbin & Strauss, 2014, p. 117). Wall memos assisted me in analysing the data to increase abstraction of concepts and categories leading to theory development and to draw clearer connections (Charmaz, 2014). Corbin and Strauss (2014) describe memos and diagrams as a dialogue with the data. In all, six wall memos were created for the initial coding of the research project. Figure 5 below is an example of one of the six wall memos. Larger photos of the wall memos are in Appendix C.

Figure 5. Wall Memo



Observations. Also included in my analysis were observations. I attended several different events to collect observational data. First, I attended the Silicon Slopes Conference. The purpose of this conference was to entice software developers from the United States to Salt Lake City for recruiting. The demand for software developers is high, and many jobs cannot be filled because the skilled workforce in the area is not large enough. The Silicon Slopes Conference also allowed me to interface with local web development companies to see how they interacted with each other, and to observe how small companies interfaced with large firms.

I also had access to a medium-sized firm and their monthly meetings. In all, I completed notes and memos on three months of meetings. Each of the meetings was an hour long. The observational memos provided a way for me to compare the meetings with the experiences shared during the interviews. It is worth noting that many of the communication challenges which emerged from the interviews were exemplified in the meeting structure and discussion points.

Each time I conducted a face-to-face interview, I also spent some time observing the small firms. For face-to-face interviews, I would come early to the interview and would observe the general climate and interactions of the employees. During this time, I would notate the spaces in which the firm worked; how interviewees communicated with other organisational members; how they hosted me; and if the firm owner or project manager would allow me interface with any other organisational members. In the memos, I was keen to note the nonverbal reactions in the interviews as well.

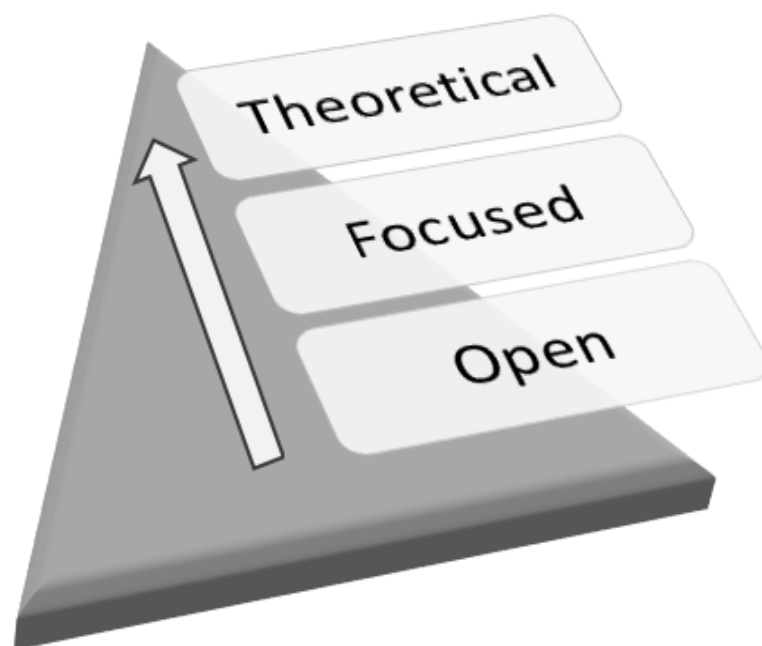
The final observation period included in the data was an enrolment in a coding camp at the University of Utah. It was a one day, six-hour coding camp for individuals with little computer coding experience, or for individuals interested in gaining experience in a new technical language. Also, I attended information systems management themed seminars and classes at the University of Utah. Table 6 lists the total hours I observed and the number of memos written. Once the data began to be collected, coding also began.

Table 6. Observations and Memo Totals

<i>Observations and Memo Totals</i>	
<i>Total hours observing</i>	21 hours
<i>Total written memos</i>	43 written memos
<i>Total wall memos</i>	6 wall memos

Coding. Coding is a way of identifying specific themes, words, and phrases important to participants in the study. In *Discovering Grounded Theory*, Glaser and Strauss (1967) give little attention to the coding phases or process (Birks & Mills, 2010, 2015). To align with the constructivist orientation of CCO (Cooren et al., 2011), data analysis was completed following a synthesised version of CGTM coding phases outlined by Charmaz (2014) and the GTM approaches suggested by Corbin and Strauss (2014). For the sake of simplicity, however, the coding phase names will be taken from Charmaz (2014), as per Figure 6.

Figure 6. GTM Coding Process



Open coding is the *interpretative* process where the data is deconstructed into concepts (Corbin & Strauss, 1990, *emphasis added*). Concepts are the words or phrases used by the researcher representing the interpreted meaning (Corbin & Strauss, 2014). Data may be broken down by doing line-by-line coding where the researcher interprets what is happening in each line of the interview transcript (Charmaz, 2014). This is called micro-coding by Corbin and Strauss (2014).

Alternatively, the data may be drawn apart by incident coding. Incident coding is the process where concepts are extracted by the researcher to label what is occurring during an event described by the interviewee (Charmaz, 2014). “Open coding stimulates generative and comparative questions to guide the researcher upon return to the field” (Corbin & Strauss, 1990, p. 12). It is a process of deconstructing the data and assigning it meaning.

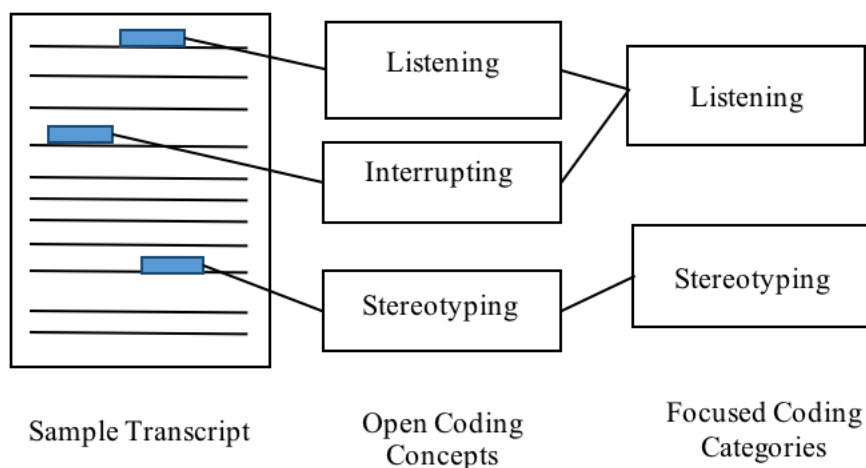
Table 7, below, is an open coding summary detailing the specifics of the initial phase of GTM in this research project. The table includes the average interview time, the total number of transcribed pages from the interviews, and the number of open codes once the open coding phase of the analysis was complete.

Table 7. Open Coding Summary

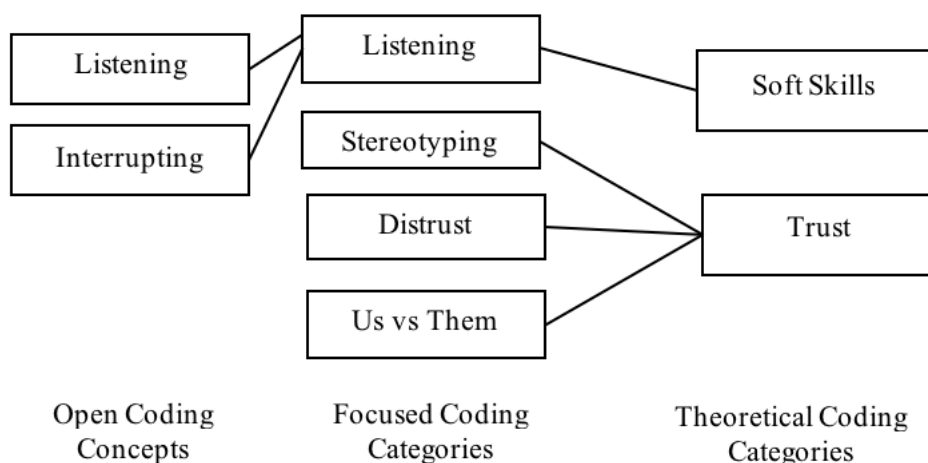
<i>Open Coding Summary</i>	
Average Interview Time	35 minutes
Total pages of transcripts	238 pages
Total number open codes	162 open codes

Once open coding produced repeated patterns and significant concepts, those concepts were merged into categories. Categories are a combination of concepts with shared characteristics as defined by the researcher (Charmaz, 2014). In the example on the next page, the hypothetical researcher coded three concepts: listening, interrupting during face-to-face conversations, and stereotyping. The category would become listening, which would include listening and interrupting. Meanwhile, stereotyping would remain a separate category due to the lack of shared characteristics in their nuanced definitions as extracted from the data.

Figure 7 below represents the open coding phase as it evolved into the focused coding phase. Focused coding is the process of taking the categories developed during the end of the open coding phase and testing them against the data (Corbin & Strauss, 1990). For Charmaz (2014), focused coding occurred by using the most significant and frequent open codes to evaluate the rest of the data. “Focused coding requires decisions about which initial codes make the most analytic sense to categorize data incisively and completely” (Charmaz, 2006, p. 57). For each approach, the purpose of this coding phase is to compare data-to-data (Charmaz, 2005, p. 50) to strengthen the relationship connections among the increasingly abstract concepts emerging from the data.

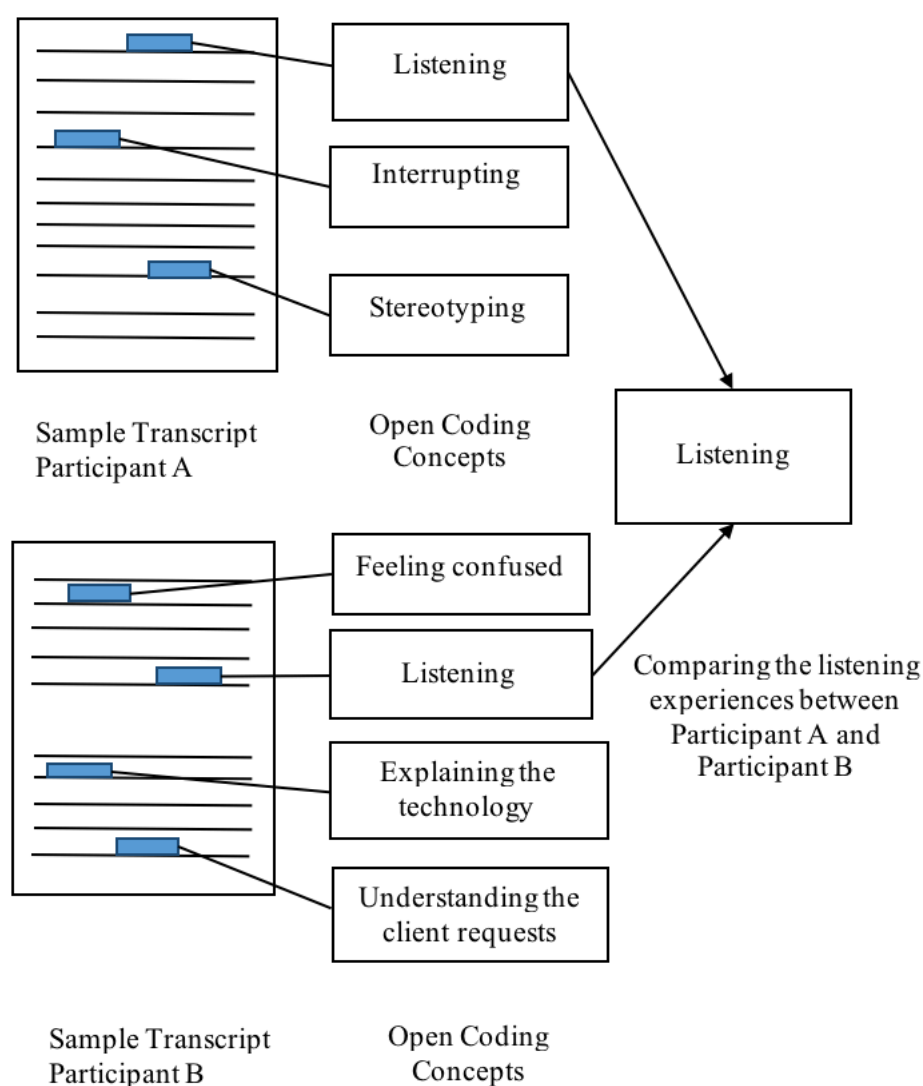
Figure 7. Evolution of the Open Coding Phase

The final coding phase is called theoretical coding, and “is a sophisticated level of coding that follows the codes selected during focused coding” (Charmaz, 2006, p. 63). Theoretical coding is the process of enhancing the substantive categories, or most significant codes (Glaser, 1978), to deepen relationships among the data and then move the relationships in a theoretical direction (Charmaz, 2014). Corbin and Strauss (1990) call this phase selective coding because all previous categories are “unified around core categor[ies]” (p. 14). Central to the last phase of coding is that the categories and relationships described by the researcher have *earned* their way into the theoretical narrative of the research project (Charmaz, 2014; Glaser, 1978), for which Figure 8, below, provides an illustrative example. A general example of the coding process for this research is included later in this section of the chapter. However, the specifics of the coding process for this research is described in greater detail in the data analysis section of this chapter.

Figure 8. Focused and Theoretical Coding Examples

Constant comparative analysis. Creating memos and diagrams are part of the constant comparative data analysis process which is unique to grounded theory; that is, analysis occurs *while* data is being collected and is not delayed until field research has been completed (Corbin & Strauss, 2014). Figure 9 demonstrates how listening was coded in two different interviews. During the comparative analysis, the context, depth, and breadth of the categories was analysed (Charmaz, 2014; Corbin & Strauss, 2014). In other words, it is the process of evaluating two similar open codes for additional insight.

Figure 9. Comparative Analysis



Initially, the open codes were compared against other open codes (Charmaz, 2014).

For example, Participant A may state similar ideas about listening when compared to Participant B with some contextual variations. Constant comparative analysis requires the statements and experiences about listening to Participant A to be compared to the statements and experiences of Participant B before interviewing Participant C. Bryant and Charmaz (2010) explain:

The GTM builds empirical checks into the analytic process and leads researchers to examine all possible theoretical explanations for their empirical findings. The iterative process of moving back and forth between empirical data and emerging analysis makes the collected data progressively more focused and the analysis successfully more theoretical (p. 1).

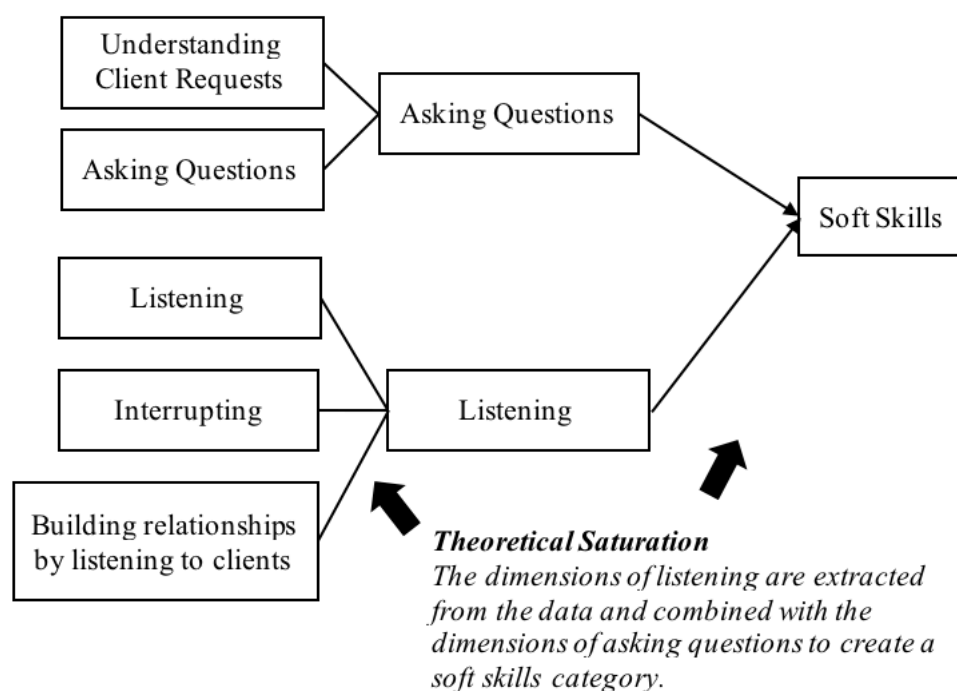
For the empirical checks to work, additional data was collected while the comparison and analysis of collected data occurred. This happens in the concept areas where the data needs additional depth or breadth.

Theoretical sampling and saturation. Because new information will emerge from new participants as the research progresses through the constant comparative analysis process additional theoretical sampling is employed. The purpose of theoretical sampling is to verify saturated categories and to create additional depth in the analysis. It means to seek “pertinent data to develop [the] emerging theory. The main purpose is to elaborate and refine the categories constituting [the] theory” (Charmaz, 2014, p. 193). It is the “process of identifying and pursuing clues that arise during analysis” (Birks & Mills, 2011, p. 176). Theoretical sampling is accomplished through accessing additional interviewees, observations, memos, texts, field notes, artefacts, or literature (Birks & Mills, 2011; Charmaz, 2006; Glaser, 1992; Glaser & Strauss, 1967).

One of the analysis patterns of GTM is to begin with several interview participants, analyse the information they provide, and then decide which topic areas need further exploration. The process of theoretical sampling provides depth in answering the research questions until the concepts have been answered to the point of saturation—the intersection when no new information or perspectives emerge (Corbin, 2014, p. 134). During this research process, it became evident that in I was missing the voice of the developers from my interviews leaving my theoretical sampling incomplete. Small business owners or project managers would rarely give access to the developers since the developers’ time away from work negatively affected firm revenue. To be able to conduct interviews with developers, I created an interview environment which would allow them to share their

experience without adding pressure to their strained schedules. Consequently, I ran a semi-structured interview with a group of developers who were referred to me by an earlier participant in the study. After hosting a lunch at a medium-sized firm, I was able to do a group interview with four developers—the only ones willing to come on their lunch break. This completed the theoretical sampling for the project as required by theoretical saturation. Theoretical saturation is a point in the research process where no additional patterns are evident in the data (which is illustrated in Figure 10).

Figure 10. Theoretical Saturation



Theoretical saturation is reached when no new insights emerge or when the data does not reveal any additional depth for the categories which have already been created (Charmaz, 2014; Corbin & Strauss, 2014). “Saturation does not see the same pattern over and over again. It is the conceptualization of comparisons in these incidents which yield different properties of the pattern until no new properties of the pattern emerge” (Glaser, 2001, 191). In this research, theoretical saturation was the primary goal of the coding process. Therefore, when theoretical saturation was reached, it meant that the interpretative meanings of the theoretical codes were achieved, and no new information had emerged in the data about the codes. As part of theoretical saturation, GTM requires theoretical sampling.

To diversify theoretical sampling in this project, additional participants were chosen from medium-sized firms. Medium-sized firms have 51-249 employees (OECD, 2005). During this phase of the data collection, I recruited participants in the Silicon Slopes region. However, my network and contacts led me to interview others in development *hotspots* in the Western United States like San Francisco, California, Seattle, Washington where interviews were conducted through web conferencing software such as Skype or Google Hangouts. These participants were primarily project managers in medium-sized firms. Through networking events, such as local technology talks sponsored by the University of Utah or technology career fairs, other individuals interested in the research topic willingly volunteered to participate.

Before I began the focused coding phase and after the open coding phase, I hired two individuals with transcription and coding experience in Hamilton, New Zealand to also micro-code the transcripts for validation purposes (Strauss & Corbin, 2008). Validating the codes within GTM means that the concepts created were logical to someone besides the researcher (Corbin & Strauss, 2014). After interviewing, transcribing, and open coding in NVivo, no new concepts emerged.

Eventually, all the NVivo open codes were printed, and I commenced the focused coding process by hand, or without the use of software, and all other coding processes were done by hand. During focused coding, I compared concept to concept in the data. If they shared similar characteristics, they became the depth and breadth of the concept chosen to represent the category. The comparative process would lead me to a title and definition of a code. In this example in Table 8, below, I use *development process* as the focused code title. From the open codes and data, I created a definition for the development process from the experience of the participants. Within the focused code, the open codes became subsets to the focused code. In the table, I have the development process with the definition and the open codes. These were included in the focused code category to add depth and breadth to the category as it was analysed.

Table 8. Focused Coding Category Examples

<i>Example Focused Coding Category: The Web Development Process</i>	
Focused Code Title & Definition	Open Codes included in the Focused Code
Development process <i>Central to the grounded theory research process is teasing out of the data the processes which occur around the general research questions. While this focused category contains some business strategy, it also represents the software development process from a communication perspective.</i>	Web development vs Software development
	Finding solutions
	Problem solving
	Being in software development
	Consistency in development
	Deterministic communication (communication is determined by client expectations)
	Assuming
	Fail early, fail fast
	Receiving feedback
	Describing the web development process
	Experience is key to success
	Changing firm processes
	Dealing with rapid industry change
	Developing software is different (than creating anything else)
	Using alliances
	Total Open Codes Included: 15

The focused coding phase produced 18 categories from the 162 open codes concepts. Seven of the open codes were dismissed because they did not relate to the research questions nor did they provide depth or breadth to any of the focused codes categories, as shown in Table 9.

Table 9. Focused Coding Summary

<i>Focused Coding Summary</i>	
Number of Focused Codes	18
Number of Open Codes Thrown-out	7
Number of Included Open Codes	155

Once the focused coding phase was concluded, two additional theoretical coding phases occurred as I employed the abductive analytical process of GTM. As theoretical sampling and constant comparative analysis cycle into theoretical saturation, additional insights through memo writing occur. Since the process of grounded theory is building theory from the ground up, it is considered an inductive process. However, grounded theory scholars suggest abduction as another pattern of logic (Charmaz, 2014; Reichertz, 2007).

Abduction. Abduction is the process of finding consistent patterns in the collected data (Bryant, 2012). Reichertz (2007) calls abduction an art and a break from the social scripts of the researcher. Abduction is risky because it moves beyond induction and deduction (Reichertz, 2010). Induction and deduction require the inherent logic of the data to decipher knowledge. In contrast, abduction goes beyond the current store of knowledge or rules to develop new knowledge or rules (Reichertz, 2010). Charmaz (2014) explains abduction as a creative process wherein the researcher considers all possible explanations and hypothesis, then chooses to engage the most plausible through empirical examination. As Reichertz (2007, 2010) and Charmaz (2014) argue, abduction is an intense cognitive process requiring the construction of new knowledge and a re-examination of processes in the research. Reichertz (2010) explains that “abduction is a cerebral process, an intellectual act, a mental leap, that brings together things which one had never associated with another:

A cognitive logic of discovery” (p. 220).

Organisational communication scholars, Taylor and van Every (2011) expound on abduction. They stated, “Abduction presumes that the subjects of the research are themselves making sense” (p. 21). This is quite different from deduction, which comes to the data with established theory, or induction which does the inverse. Abduction is the process of favouring neither deduction nor induction; “it privileges both” (Taylor & van Every, 2011, p. 21). Taylor and van Every (2011) agreed with Suddaby (2006), claiming the intersectional use of both deduction and inductions is what makes abduction relevant for grounded theory practitioners. In my research, Suddaby’s (2006) and Taylor and van Every’s (2011) perspective on abduction were used to bring new insight and knowledge to the research project. Notably, Taylor and van Every’s arguments on abduction provide an additional intersection between grounded theory and organisational communication research. That is, an abductive approach allowed the research participants to define the specific codes, challenges, or questions which needed answering according to their

experience (Glaser, 1978). It also provided a precedent for me to use existing organisational communication research and theory.

In this thesis, abduction was a twofold process which happened during the theoretical coding phase. First, I compared the focused codes against focused codes; and, second, I compared the focused codes and the emerging theoretical codes against current research and literature in organisational communication and, when appropriate, in communication-oriented strategic management practices. Theoretical coding “not only conceptualize[s] how your substantive codes are related, but also move[s] your analytic story in a theoretical direction” (Charmaz, 2006, p.63). While comparing focused code against focused code, five major theoretical categories emerged. The theoretical categories were: communication as tension, ambidexterity, trust, soft skills, and organisational literacy and translation. However, when comparing the theoretical categories and the focused coding categories against the literature, the theoretical categories began to shift, resulting in the findings chapters of this thesis and its focus on entangled tensions. The last GTM term needing defined is theoretical sensitivity.

Theoretical sensitivity. Theoretical sensitivity is the way in which grounded theory accounts for the researcher (Bryant & Charmaz, 2011a; Creswell, 2009). It is the researcher’s state of openness (or closedness) to the data analysis (Glaser, 1978). Theoretical sensitivity related to the predetermined ideas which exist in the mind of the researcher. As Charmaz explained, theoretical sensitivity is the *standpoint* of the researcher about the topic (Gibb, 2015). The more predetermined the ideas, the more insensitive the researcher is during the analysis. Birks and Mills (2011) claimed the more engrossed the researcher becomes in the data, the more sensitive the researcher may become to the abductive possibilities of the material.

Theoretical sensitivity is the connection of the researcher to the research topic and the participants (Bryan & Charmaz, 2011a). Charmaz (Gibbs, 2015) recommends the researcher’s standpoint affect the research. The standpoint, as defined by Charmaz, is the perspectives and beliefs the researcher brings to the research project (Gibbs, 2015). For me, the first point of theoretical sensitivity, and research standpoint, is that my husband is a software developer. I noticed that while he would describe his work experience, there were consistent organisational communication problems in the firm in which he worked. The problems he described could be addressed and supported by organisational communication as a

discipline; however, the leadership in the organisation was unaware of the strategies to support their management styles, or they were more interested in making money than organisational morale. As a result, I wanted to explore the research about communication in web development firms.

My second point of theoretical sensitivity was my interest in the experience of the practitioners. While leadership literature and research are important, I was curious about the reality of the *other* employees in technology firms. Since my father had been a small business owner whose business had failed, I wondered about the intersections of the small business owners in technology. Also, I was curious about small technology firms that are often overshadowed by larger technology firms, particularly in the United States.

The third point of theoretical sensitivity for me was my openness to the project (Glaser, 1978). While I did not come to the research as a *blank slate* (Urquhart & Fernandez, 2013), I came as a new student to many of the topics which emerged from the research as well as the grounded theory process. Therefore, the communication challenges and intersections of the practitioners and their experiences were novel, allowing me to observe the detail of the communication flows without taking any section of the process for granted. However, I must note that over time, I became increasingly sympathetic to the web developers, which affected my interpretation of the data.

The fourth and final point of theoretical sensitivity was location. Although studying at the University of Waikato in New Zealand, I lived off and on in Utah. Utah, as mentioned in the background chapter, is a unique hotbed of technology development and tech start-ups. I was initially concerned that the findings would be isolated to the region. However, as new theoretical sampling, or data collection happened, it became clear the communication challenges were industry-specific and not location specific.

Adding Tension Analysis to GTM Coding

This section of the chapter will review the tensions analysis process by providing the sequence of events which led to entangled tensions. The process proceeded as follows. Grounded theory open coding lead to the identification of dialectical tensions. It was evident early in the study that organisational tensions were an important part of web development. Interweaving theory does not dictate the data coding and findings; it does mean the theory is intermingled with the coding and findings process (Urquhart & Fernández, 2013). GTM research

provided a precedence to synthesise the tensions into a GTM study (Urquhart, 2011; Suddaby, 2006). Therefore, the tensions evaluation resulted in depth and breadth as dialectical tensions were compared. It was during this coding and comparison process that entangled tensions were developed. After developing entangled tensions, I used the framework to evaluate the rest of the data.

Using dialectical tensions may seem the antithesis of GTM. However, dialectical tensions emerged from the data without forcing dialectal tension theory (Glaser, 1992). When I was reviewed the data, it seemed unwise not to use an analytical concept that emerged from the data. During open coding, the dialectical analysis worked well. It provided examples of opposite poles observable in the organisations and the texts of the interviews. As a result, I applied GTM and tensions analysis to the data. To provide an example of this process, I have included Table 10, below. It is a list of organisational tensions written in a dialectical tension grammar.

Table 10. Open Coding, Tension Cluster Example

<i>Open Coding, Tensions Cluster Example</i>		
Tension Title	No. of Participants	No. of Incidents
Us vs Them	10	29
Talking to business people vs. Developers vs every other department in the firm	14	51
Local vs Global	6	11
Reactive vs Proactive	2	2
Quality vs Competition (getting it done!)	5	9
Many skills vs. Highly specialised skills	3	5
Creativity vs. Management Control	5	6
Creativity vs. Client Control or Client Expectations	1	6
Communication for Own Organisation vs. Communicating on behalf of the client	3	4
Average day vs. Terrible day	1	1
Arrogance vs. Humility	1	3
Saying no vs. Saying yes	7	7
Predetermined communication vs. Strategic communication	4	4

Consistent with GTM, the open coding comprised the initial analytical process, but not the final result. As coding continued, the data indicated that the tensions pulled in many directions at once as if it were a network of dialectical

tensions enmeshed together (Barad, 2003, 2006; Latour, 2005; Sheep et al., 2016). Eventually, the dialectical approach inadequately reflected the practitioner's experience. It was at this point that I began comparing dialectical tensions. In this process, it appeared that tensions in the firms were embodied and constituted within each other (Cooren, 2010; Putnam, 2015). Bakhtin's writings added insight to this multi-layered, tensioned phenomenon.

Kuhn (2014), drawing on Kristeva's (1980) interpretation of Bakhtin, explained that "intertextuality refers to the idea that there can be no utterance without relation to other utterances" (Kuhn, 2014, p. 248). Utterance is intentionally plural. Bakhtin (1984) explained that meaning comes from the conflict of multiple voices, or utterances. In other words, as individuals engage in dialogue they create shared meanings for the words they use. Bakhtin believed that developing shared meanings for language was a cyclical process. Eventually the unshared meanings conjoined and the meaning of the word or idea emerges as similarly defined for all parties involved. Therefore, the process of creating shared meanings is inherently conflicted, according to Bakhtin (1984, 1993). Like Kuhn (2014), Cooren (2006) wrote about conflicted meanings. Cooren (2006) argued that creating shared meaning takes several steps. It began with dialogue, and shared meaning became actionable as the dialogue became text. At this point, the newly shared meaning would be effectuated to action and agency. Drawing on Latour (2005), Cooren (2006), like Bakhtin (1984), acknowledged that "according to this approach, we never leave the *terra firma* of interaction" (p. 82, emphasis in the original). In other words, to create shared meanings dialogue must happen and tension must be resolved. I applied this principle to dialectical tensions. Extracting tensions into dialectical poles disaggregates the process. The tensions were too interconnected to pull apart without losing some of the complexity and depth of the organisational experience. An example of this complexity came from the us-versus-them tension that is developed in Chapter Six.

Data Analysis

I have described the GTM process, its methodological terms, and described how these processes were used in this research; however, the analysis between coding phases remains unexplained. Developing a substantive theory is a creative work of logic. There were three primary tools employed: constant comparisons, abduction, drawing on the current literature, and reading multidisciplinary works.

My approach to constant comparison was taken from the work of Corbin and Strauss (2014). They define constant comparisons as “taking one piece of datum and examining it with another piece of datum” (p. 93). This was accomplished in phases throughout the coding process. Initially, I would compare a concept to similar concepts within one interview. Then I would compare it to another interviews. During this phase, I would search for ideas that had similar meanings, or practitioners that had similar experiences. This comparative process lead me to themes or, as they are called by GTM researchers, categories. Evidence of this process may be found in Appendix C. Once I had delineated the categories, I began to look for depth and breadth of concept. For example, in Appendix C, I give a list of open codes. These codes were thematically combined to create the focused codes.

After creating the focused codes, the data analysis transitioned into the thematic coding phase. To begin, I would compare the categories against the current literature. My objective was to compare and contrast the current codes to see if there was additional depth or breadth that could come from what had already been studied. Along with this, I used abduction by memoing. I would not favour induction or deduction. Instead, I would write my observations about the concepts and the current literature, and would ponder on what they might mean to the practitioner and to me as a researcher. Then, I would develop patterns of connection through the memoing process. On occasion, I would diagram the data, the patterns I had seen, and the literature using wall memos (see Appendix D for an example).

It was during the memoing and writing processes that the entangled tensions categories emerged (see Chapter 6). Also, the writing and memoing processes required that I read multidisciplinary literature to find concepts, words, or themes that better represented the experience of the practitioners. It was during this process that I developed the concept of organisational proprioception (see Chapter 7). Then, in accordance with my research questions, I would aggregate the categories to the tenants of CCO.

GTM and CCO

Combining GTM with CCO provided a unique academic challenge. CCO can be confusing with the variations and nuances, given the different tenets and perspectives among the three schools previously cited in the literature review. While the primary purpose of the three CCO research approaches is the same—that is, a focus on how communication constitute organisations—researcher’s biases are

different and need to be accounted for in the research process (Schoeneborn et al., 2014). In GTM, researcher bias plays an important role in how the researcher codes, emphasises, and evaluates collected data (Charmaz, 2014). While each version of CCO theory has its strengths and weaknesses (Brummans et al., 2014; Schoeneborn et al., 2014), GTM was employed in this research with CCO to demonstrate which version of CCO provided an adequate application (see supporting research question #4). Both Luhmann's Systems Theory and the Four Flows proved to be too top-down in research strategy. Luhmann's System Theory has a comparatively peculiar concept of communication and its purpose which did not align with my epistemological or ontological orientations. The Four Flows model is too deductive in its research expectations by predicting which communication flows and purposes must be the focus of the research (Bryant & Charmaz, 2011; McPhee, 2015; McPhee & Zaug, 2000). The data would need to be *mined* and would be descriptive only (Charmaz, 2014; Glaser, 1992). In contrast, however, the Montréal School's focus on discourse analysis and the *communication process* better aligns with the purposes of GTM as well as the research questions, and the Montréal School best supports abductive methodologies to organisational communication (Taylor, 2011). Furthermore, the Montréal School's relational perspective on organisations and the implied imbricated nature of organisational life aligns well with the research purposes. This combination of GTM, CCO, and multidisciplinary literature will be expounded on in the findings chapters and conclusion of the thesis.

Orienting the Reader to the Findings Chapters

The findings were written into three chapters. The chapter titles are the theoretical codes, and the subheadings in the chapters are focused codes. The material quoted in the chapters are from the interview transcripts and the memos written throughout the project. Also, to protect the identity of the research participants and the organisations, the names of all identifying information were changed. Notations of the quotes from the data will be as follows: in brackets, protected identity name, organisational role, transcript number, lines in the transcript from which the quote was drawn, for example: [John, project manager, #50, lines 100-105].

Conclusion

The chapter detailed the methodology and methods used in this research. In the methodology section, I described the GTM and CCO's connection to pragmatism and imply that this study's epistemology and ontology also align with

pragmatists, constructionists, and ultimately, symbolic interactionism. In the section on GTM methodology and methods, I defined GTM-specific terminology and describe how these methods were used in this thesis. I concluded this chapter by justifying my inclusion of tension analysis and my logic for connected GTM and CCO.

GTM for organisational communication research provided an interesting challenge. As Charmaz (2014) described, the GTM process requires pulling the data apart and putting it back together. Instead of collecting all the data at once, or coding all the data at once, both processes happen simultaneously. This was an insightful and challenging process as demonstrated by the organisation of this chapter. GTM allowed me expose findings early, which assisted in my ability to persuade additional interviewees to participate. It also provided a *whole view* of the web development experience, requiring me to reach out to individuals occupying many organisational roles in web development firms. Furthermore, it was valuable for its insights into the gaps in organisational communication literature, as discussed further in the findings chapters.

Collecting and analysing data, according to GTM, provided some unanticipated hurdles. It was difficult to discern which portions of whose approach to GTM should/could be used. In the end, the similarities of the various approaches were combined into the most logical and effective lens for the data set. It was challenging to go through an entire coding process, only to do the process again for a tension analysis. However, the process did add insights not otherwise obtained or required by the general research questions. These are elucidated in the proceeding findings chapters, beginning with the contextual findings chapter which describes the organisational roles and structures of small and medium-sized web development firms as described by the participants.

Chapter Five: Contextual Findings

This chapter focuses on the contextual findings and is the first of four findings chapters. This chapter is a collection of knowledge gleaned from my observations while I was present in the firms as well as from implied content in the interview data. This material provides context for the other findings chapters. The purpose of the chapter is twofold. First, it describes the context of the web development process according to the research participants. Second, it details the organisational social structures and roles common in web development firms. This chapter does not connect to any of the research questions, *per se*. However, it provides context for the processes revealed by this study (Charmaz, 2014; Glaser & Strauss, 1967).

In this chapter, three contextual findings are described. By contextual findings, I mean the organisational framework within which the findings were bounded. For example, the communication challenges of a small web development firm are different from the communication challenges in a small retail business. Contextual findings are significant since they provide an understating of the setting in which the other findings occur and the basis on which to understand the other findings. The contextual findings are also important because they explain the social structure of the firms that participated in the study. Thus, the chapter provides the reader with initial exposure to the observable dynamics of the firms and foreshadows the potential communication challenges they faced. The greater proportion of the contextual findings presented in this chapter come from the observation data collected at the coding camp, observations in the small firms, observations from firm meetings, and from the participants in this project.

In the following sections of the chapter, I discuss web development as it occurred within the organisations. Following this, I outline the social structure and organisational roles as they were observed in the firms and as they were described during the interviews. Then, I explain the connection of web development to project management. The format for this chapter is also important since it sets the precedence for the other findings chapters. In each chapter section, a series of quotes are provided as evidence of the claims being made. The quote lengths may be short or long. The quotes are indented and set apart from the rest of the chapter discussions. The reason for distinctly separating the quotes are for ease of reading and to make a sharp distinction between my thoughts and the participants' experiences, or the memos I wrote following the interviews. Then, after the data is

presented, a discussion about the quotes is provided. I begin with the web development process in the organisations that participated in this research.

Web Development Process

In this section of the chapter, I review the web development process by comparing it to software development. Then, I outline the web development process as the practitioners described it. Since small and medium-sized web development firms were the focus of this study, understanding the web development process helps the reader make sense of the communication concerns faced by the participants. Also, as mentioned in the background chapter, software development and web development are slightly different. Simply defined, software development is a computer programming process which creates a product that can be accessed whether the hardware or device is connected to the Internet or not. However, web development is a subset of software development requiring a device or hardware to connected to or sync with the Internet.

Historically, software development and web development were distinctly different. Software development began with the advent of computing (Mens, 2008). The software development process has evolved from creating an entire computer program at once—through the waterfall development model—to involving a much more flexible, iterative project management approach where the software program is initially developed, and then updated and improved upon as the software program is tested, used, and maintained (Henriksen, 2016). This is called agile development. Agile development has become interconnected with web development (Ensmenger, 2012; Henriksen, 2016; Mens, 2008; Schwalbe, 2013) as a flexible develop-as-they-go project management approach (Henriksen, 2016). This is important because the participants involved in this research who had computer coding experience considered themselves to be software developers or software engineers not web developers. Below are several quotes demonstrating their view of the link between software engineering and web development. Note the logic used by the participants to connect software and web development:

We are in business because we try to be innovative, *especially in the software industry*. That's really what I do. . .I also architect software. I design websites [Jeremy, small firm owner, #20, lines 14-15, emphasis added].

One of the biggest communication challenges we have as a *software development company*. . .[even though the company for which this developer worked was a web based product] [Sebastian, developer, #11, lines 113-114, emphasis added].

It's not like making a wooden box that you've made a hundred times, you know; they just don't get that; *software engineering* is [silence while thinking]; it's an art [Mark, developer, #31, lines 447-449, emphasis added]

Whether it is software development or web development, the process of creating computer software-based technologies is perceived as a parallel process and is conceptually similar according to the practitioners. Both software development and web development are project-based and employ the principles of agile development (Schwalbe, 2013). However, it may be argued that they are different processes which meet different client needs. Software development and web development once differed in purpose and method (Vijayasathya & Butler, 2016), but note the quote from a memo on the observations I made after completing and coding 22 of the 32 interviews.

For the participants, development was development. There was no need to differentiate software development from web development. And, in some cases, there was outright objection to having the two terms separated. [Memo I, 16 April 2015, lines 25-29].

As traditional software moves to the Internet, or the cloud, the two approaches are increasingly blended. The blending of these processes is encapsulated in agile development.

Agile Development. McConnell (1996) described the details of agile development 20 years ago. Initially, a client or organisation decides to create a web development project; the details and objectives of that project are agreed on and planned. This is the *scope* of the project. The *time* frame and the *cost* of the project are determined. Then, everyone on the project team begins working to achieve the predetermined objectives. Risks to the scope, time, or costs, such as an overly optimistic development schedule or poor-quality work, are managed. *Ideally*, communication among the team is consistent keeping everyone aware of what is happening until the project is completed. Again, the process described here is ideal. While it is the foundation of the agile development process, the experience of the practitioners described a more *reactive* development experience.

You do what you said you were going to do when you said you were going to do it. When stuff does break, fix it. It's just a lot of those things. Basics of human behaviour [Steven, small firm owner, #4, lines 112-113].

We have a lot of communication pains around just growing up as a company [Demetri, project manager, #17, lines 99].

We do agile development, so it allows you to essentially track the dependencies back and forth with it, and then a lot of it; quite frankly, it's getting out of his seat and walking over and talking to the other team and discussing when they can have something in, whether it's a week, two weeks or whatever. From there, it's kinda coordinating how we will do architecture and all those sorts of things. You'd be shocked at how often that gets misconstrued [William, project manager, #9, lines 64-70].

In these quotes, Steven, Demetri, and William explained the complications of agile development. Their experiences are organic; meaning, the work is reactive to the environment and the needs of the firm and stakeholders. Agile development accounts for the growth and change, and yet, when interviewing comments like William's "You'd be shocked at how often that gets misconstrued" [line 70] was underscored with frustration. The growth of the company or completing a project from beginning to end is replete with communication-focused stressors for the firm members. These comments also demonstrated the organic communication management and growth processes of web development firms as described in Kukko's (2013) research. The process detailed in the next section is a compilation of the experiences shared by the participants explaining how a web development project proceeded in their firms.

Initialising a project with a web development SME. To initialise a website build, the potential client contacted the firm for a bid, or an estimate of time and cost, about the services the firm offers. Steven [small business owner, #4, lines 105-106] said, "There's the whole bid [or estimate on the project cost and timeframe] process too. We put together a bid; here's what they wanted; here's what we are going to build." Some of the firms participating in this research provided other services, such as networking, e-commerce, or marketing. After the bid was given to the client, *if* the client accepted the bid, the contract was signed. Next, the client would meet with one of the firm's communication representatives.

A communication representative could be a project manager, business analyst, or a small business owner. Even the smallest firms had an individual designated as the *communication person*. After working with the communication person, the contract was finalised and the details of the project were set in motion. Then, the project information was given to the developers. Throughout the website build, the communication person would interface with the client. Also at this juncture in the project, the developers began to create, complete, or maintain the tasks assigned to them as dictated by the contractual agreement.

According to the participants, and from what I observed, the organisational structure and culture provided the client with a single point of contact. That is, the client would be given the contact information of the person who was the project manager, although *project manager* might not be the literal title given to the role. Only under rare circumstances would the web developer interface with the client. If the client had a problem, they would share their concerns with the person assigned to represent the firm. The only exception witnessed to this pattern was a web development firm which functioned entirely online. In that case, everyone in the firm telecommuted because nearly all of them lived in a different country. The owner would invite the clients to the company's forums, chats, etc. In many ways, the client was treated exactly like an employee/member of the organisation. In the other firms participating in this research, the clients' concerns were communicated from the project manager or small business owner to the developer in face-to-face communication; or, more likely, by adding to the developer's collaborative online task list or through an email to the developer.

Spatial Communication. As CCO research stresses, even how a firm organises the desks is a communication event (Cooren, Kuhn, Cornelissen, & Clark, 2011). I consistently observed this phenomenon in the Utah-based small firms involved in this research. Often everyone worked together in an open office; there were no cubicles or other types of dividers. It was also common to have individuals' work offsite, or telecommute. In all the small firms, at least one person telecommuted and most often, s/he was a developer. In contrast, I noticed through observation that developers in medium-sized firms were separated from the rest of the firm for functional purposes. The developers in medium-sized firms required a quiet, focused workspace because of the demands placed on them.

The participants explained that as a firm grows or takes on more clients, developers became increasingly bombarded with requests from the rest of the organisation. These constant requests would eventually lead to the developers' physical relocation. The next quote is evidence of what happens as a firm grows. It is a snapshot of the process between the observations made at the established small and medium sized firms.

We got another office space was for two reasons; well, one reason was for some space so they weren't talking to each other; but also, to get the developers away from everyone else to prevent everyone from *just saying* requests [David, CEO, #6, lines 263-266, emphasis added]

The separation of the developers from the rest of the team was a literal message to *wait-in-line* for the work which needs to be done. A wait-in-line task structure for the developers is intended to distribute demands placed on the developers within a first-come priority system. Illustrated through two quotes below are how the developers work with a wait-in-line process:

We have a group chat just going on all day long, about problems or like “hey this is a really hot customer issue, and I think we’re like losing data;” you know whatever their problem might be; but, issues that need urgent attention; that we don’t; [we don’t to] wait for it to percolate through the task tracking tool [Demetri, project manager, #17, lines 219-222].

Well, that comes back to communication and reinforcing the method of, “Well, no you still need to open the ticket even though you can get to me right away, and ask me a question. I still need you to get in and write me a ticket” (A ticket was a task listed in the task manager at their firm.) [Michael, project manager, #10, lines 96-98].

The dynamics among developer priority systems and office layouts were symbolically significant as it affected the development process and then communication flow. The priority task system was important because the task-completion-demands on the developers were high and because it affected the morale and intensity of the work.

Another observable part of the web development process was the high-priority tasks which were emergency fixes, or *bugs*, that needed to be repaired in the code of a website. Oliver [small firm owner, #5] explained these emergency repairs and how they are perceived by the client when compared to the developers’ perceptions. He said, “It’s broken because of that bug. It might be a minor bug to [the developers], but to [the clients], it stops the whole process to accomplishing what the software is supposed to do” [lines 91-92]. Therefore, the developers needed to refocus their attention on the bug to repair it for the client and forsake existing tasks listed in their task managers.

Starting a project, repairing bugs, client conversations with the designated communication person, and the developers having to solve problems to complete the client requests happened in a daily cycle. The cycle continued until the developers completed the website. Once the developers finished the project, in medium firms, quality analysts would test for problems. In small firms, the clients would test their websites on the Internet. If the website did not present or function as the client requested, the process started again until the clients’ needs were met. Web development, as a cyclical process, was dependent on each organisational

member fulfilling the role assigned to them by the project manager or the small firm owner. In the next section, the organisational structures and roles are described in greater detail.

Organisational Social Structure and Roles

Organisational social structures and roles in web development firms are variable and dependent on services provided by the firm. This means that there would be different IT professionals for the different technologies within these services (Schwalbe, 2013). Grace [graphic designer/small business owner, #1] explained how a web development firm could be structured. She said, it “depends on the kind of web development you are talking about; because, there are a lot of people like us that do everything and then there are a lot of people that are super specific” [lines 68-70]. Here, she was describing how difficult it was to describe the organisational roles in her firm as compared to other small firms. However, Grace’s quote foreshadowed how the firms were organised; while some firms had specific roles assigned to one person, many had one person assigned to many roles. The definition of the organisational roles common to the firms was needed to clarify and contextual interpersonal relationship conflicts that are discussed in the other findings chapters. This information gives the reader the detail needed to understand the flow of communication patterns and the communication tensions common in the firms.

Table 11, on the following page,, briefly details the different organisational roles in small and medium firms per the research participants and are divided into the organisational purposes where they primarily function.

Table 11. Organisational Roles

ICT roles	ICT/Business Blends	Business roles
<ul style="list-style-type: none"> • Back-end developers • UX/UI developers • Full-stack developers • Networking • Testers and Quality Assurance 	<ul style="list-style-type: none"> • Project Managers • Help desk personnel • Business Analysts <hr/> <ul style="list-style-type: none"> • Designers 	<ul style="list-style-type: none"> • Owners • Marketing • Sales • Human Resources • Accounting

In Table 11, the organisational roles categories are ICT roles, ICT/business blends, and business roles. ICT roles are positions in the organisation which deal exclusively with the creation, implementation, maintenance, and repair of the computer hardware or software technology in the firm. This definition of ICT roles is the base of the firms' organisational structure. Metaphorically, they would be the foundation of a building. The ICT/business blended roles are organisational positions which exist between ICT and management. Their purpose is to ensure those without technical knowledge understand the constraints of the technology, and those with the technical knowledge understand the needs of the business or clients. Project managers and help desk roles are designated communication personnel and are defined later in this chapter section. Graphic designers are the exception.

Graphic designers provided a unique cross section at the ICT/business blend. They are the visual creators of the website while the developers are the functional creators of the website. Graphic designers worked directly with the client; in contrast, the developers rarely-to-never worked directly with the client. In the interviews, the graphic designers were designated as *the creative ones*. Most of the firms had developers and designers. Also the graphic designers worked closely with ICT; yet, they did not act as a mediator like a project manager would—unless it was a micro-firm or a firm of 10 employees or less. Business roles are jobs specifically concerned with improving the profitability of the firm.

ICT roles are software developers or network administrators. Software developers were divided into four groups: front-end coders, back-end coders, full-stack coders (a front-end/back-end blended coder), or testers/quality assurance (QA). While the division between back-end and front-end coders was merging, they are traditionally different roles. A back-end developer maintained and wrote server-related code. Front-end developers would maintain and write code that is executed

by an Internet browser and are also called user-interface or user-experience developers (UI/UX). Full-stack developers are individuals with the skill set and programming language knowledge-base to write both front-end and back-end code. Finally, those in ICT networking roles keep all the hardware communicating properly; the developers and clients are dependent on succinctly working hardware.

For this research, networking administration roles were implied or briefly mentioned by 29 of the interviewees. The remaining three interviewees explicitly mentioned networking positions because of their leadership roles, or because they had some experience in networking. Quality Assurance (QA) is equally important but was rarely a position mentioned by the participants. QA roles were often absent in the small firms and were referenced by individuals working in medium firms. If anyone took on the role of quality control or testing in small firms, communication concerns about his or her roles were never mentioned. However, several small firm owners mentioned problems between their clients and developers which could have been thwarted if testing or quality control was employed.

The ICT/business blended roles were typically communication-specific roles. Their purpose was to enable technical translation or to clarify highly-technical language for the client or the business teams. Project managers and help desk employees were likely to be found in medium-sized firms. Project managers “strive to meet the specific scope, time, cost, and quality goals of the project” (Schwalbe, 2013, p. 10). In small firms, the owner would describe their role as a project manager without knowing it. When the developers provided the client with the finished product, if the client needed support the *help desk roles* would provide that support. Again, these roles appeared differently in small firms. In small firms, it was observed that marketing specialists might also provide help desk support. Medium firms usually had designated help desk or client support roles.

Besides the ICT role in the firms, several business development-oriented roles existed. Owners and managers were structured differently depending on the organisation's size. In the small firms, the owner was central to the operation and acted in several different roles. In medium firms, the owner had become part of a larger management team. Marketing personnel were responsible for firm marketing, and in the small firms, they were managing the marketing for their clients as well. The sales roles remained a critical position, no matter the firm size. Human resource duties in small firms were fulfilled by the owner or *upper management*. Typically, in medium firms, there was a designated human resource person. While there was

considerable discussion about firm finances, accounting roles or other financial-type organisational roles were rarely mentioned.

The difference between small firms and medium firms was how many roles each person would be required to take upon him/herself. It is also important to mention that each of these organisational roles had a precise jargon. Detailing the different organisational roles and their unique jargons, no matter who fills the role, demonstrated the various expertise needed to meet the firms' needs. Furthermore, it demonstrated the layered nature of a small firm and the growing human resource needs of a medium firm. It also illustrates intersections where communication tensions and conflict could occur. As a result of many jargon-specific roles, the jargon often needs to be translated by and to several organisational members.

Project Management and Web Development

In smaller firms, the firm owner was typically the project manager or the business analyst. Although, in the interviews and observations, they were consistently unaware of their performance in this role. In the medium-sized firms, project managers and business analysts performed similar functions with minor differences; that is, they managed client needs and interfaced with the developers for the clients. Also, they interfaced with the clients on behalf of the developers. Occasionally, this role was filled by the Chief Information Officer (CIO). For this section of the chapter, when I refer to *project manager* I am referring to the roles which translate the development process for all stakeholders (Schwalbe, 2013).

As implied in the previous paragraph, web or software project management is notably different from all other organisational roles. Like small business owners, project managers manage all aspects of a project. A project is a temporary venture undertaken by a firm to create a unique product, service, or result for themselves or a client (*A Guide to the Project Management Body of Knowledge*, 2009). To be able to complete the venture, web development project managers have several objectives requiring a variety of skill sets (*A Guide to the Project Management Body of Knowledge*, 2009; Schwalbe, 2013); for the sake of this research, communication skills are the focus of the discussion.

The project manager oversees the delicate management of the project constraints. *Project constraints are the boundaries within which the project occurs.* For example, how much time will it take to develop a website; how much it will cost; or, what does the client need and want? This is the *scope* of the project (Schwalbe, 2013). Another concern is the quality of the project (Schwalbe, 2013).

Since client relationships and firm success depend on communication around project constraints, several participants mentioned its importance. Demetri [project manager, #17, para. 9] said:

[With] a lot of these big projects you can have either the exact feature set [that] we originally promised or you can have the exact date that we originally promised, you know, or you can have high quality. But, it's kind of one of these things—we're picking the two of the three, so often times what we do is we try to negotiate feature sets or stuff . . . It just gives it a little more flexibility, where like, if we think that the dates [are] looking tight, we'll just cut some of those other things [the features], that's just one way we try and manage the risk, we usually can't sacrifice, like, the dates are super critical and the quality [is] super critical, so often times it's just a matter of trying to reduce the scope of the work you try to, you know, get it in on time [lines 122-136].

In this quote, Demetri explained the challenge of trying to manage the time, the scope, and the cost of the project. As he said, of the three project management constraints, time often took priority. However, knowing what the client wanted was equally critical, even if the project manager has to convince the client *not* to add certain web features, as Demetri suggests. Oliver [marketing director/small firm owner, #5] said this:

You have to listen to what the customer says because they will drop things on you; where they are not really telling me what they expected, but they were hinting at it. If you don't catch what they are saying outside of the scope, you are going to have massive problems later [lines 139-141].

Among those significant problems, will be the cost. Sean [small firm owner, #24, para. 5] explained, the services and cost need to be detailed from the outset of the project because major challenges will occur down the track. He said:

Anything not included here will cost, a delay will incur more cost if it's not there. So, [the client] can say "oh I thought it was going to be part of this", but obviously it's not listed, so it's not part of it [lines 86-87].

In each of these quotes, the conflict centred around the attempt to create an equilibrium among the cost, scope, and time constraints. Counterbalancing these constraints for the success of the project is vital (Schwalbe, 2013). This required communication skills and a precise knowledge of what is needed to complete the project and meet the client's expectations.

Also, among the skills and objectives required for software project management is knowledge about the web development process. As Schwalbe (2013) explains, ICT technologies change rapidly requiring project managers to stay informed and educated about new technology. Of the seven project managers

interviewed in this research, all had previous experience in software or web developer roles. Jameson [project manager, #28] suggested that those with previous experience as developers make the best project managers for web development:

I know according to the purists, the pure project management theorists, you should be able to be a project manager without knowing anything about IT; I should be able to. I haven't seen that concept work. This organisation has tried and hired IT project managers that didn't have IT experience. The best project managers they have come up with have IT experience. If, they were a business-side manager having them work together helps. I haven't been able to see an individual work [as a project manager] that didn't have any IT experience [lines 5-9].

To restate what Jameson is saying, to be a successful project manager, the project manager needs to know software development and the intricacies of information technology. In this quote, Jameson describes that project management theory is helpful, but not enough; a manager also needs to know the development process. This is important because of the communication around the process, if not fully understood, causes “massive problems,” to use Oliver’s phrase. These quotes begin to establish the value of communication skills derived from the technical experience in web development firms.

Another skill set needed by an ICT project manager are a variety of communication skills. The ability to communicate, not just to manage a meeting or a client, are imperative to project management success (Daim et al., 2012; Dillon & Taylor, 2015; Dow & Taylor, 2008; Kliem, 2007). In essence, a project manager is a hub through which the needs, expectations, and understandings of all stakeholders involved in the project are communicated (*A Guide to the Project Management Body of Knowledge*, 2009). William [project manager, # 9] provides a concise example of why high-tech communication is important for project managers, CIOs, or small business owners. He said:

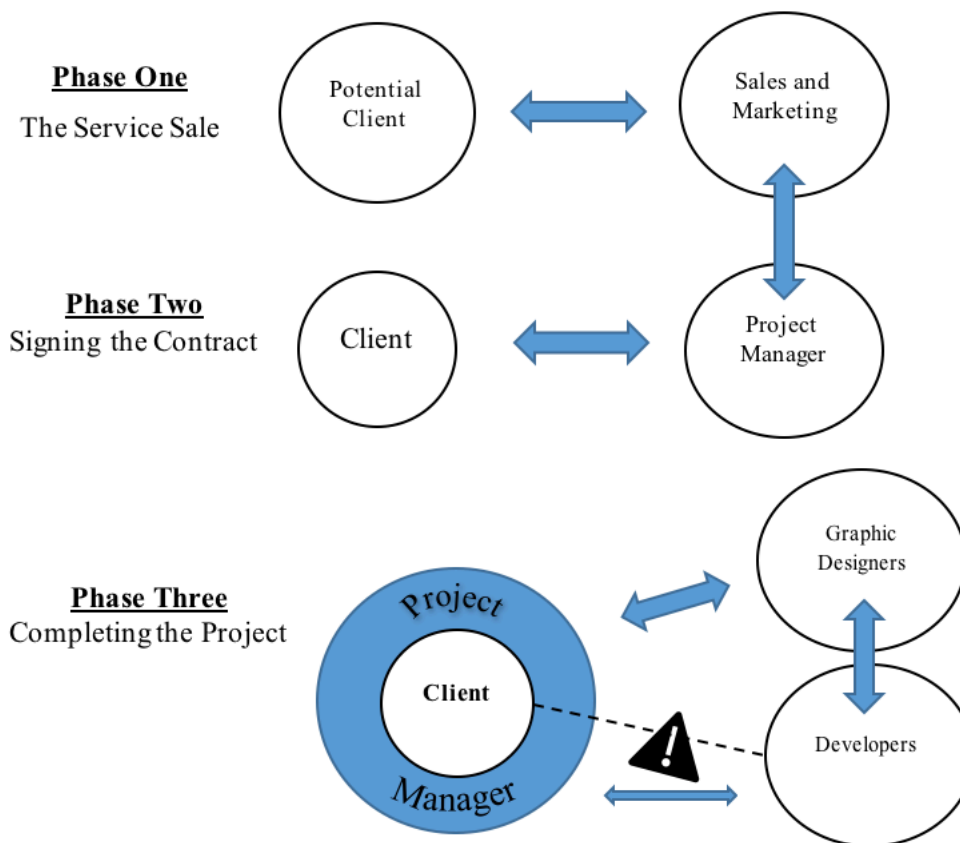
They have to be able to do it [communicate] in multiple mediums. By that, I mean, written, pictorial, verbally, and also, I would say in different lengths. What I mean by that, like if you take a start-up, they always say: you have your elevator speech, your 30-sec speech, your hour-long presentation, and etc. And you have to be able to effectively communicate the idea and the detail depending on your audience and timeframe involved and to do that, right, that means PowerPoint and probably video and a room with a projector and a bunch of people in it. If you are just talking to somebody in the hallway or whatever, it's probably no more than a couple of minutes, and if you really want to clarify something, you have to be quick and concise, and they have to be able to picture it in their head [lines 171180].

In this quote, William details each type of communication skill required to function as a project manager, CIO, or small business owner. First, a project manager needs to be able to use picture-based, text-based, and verbal communication adequately. Second, the project manager needs the ability to describe the project, services, or project constraints for varying lengths of time. Third, a project manager must use a variety of technologies to communicate. Fourth, and finally, the project manager needs to understand the knowledge level of the person to whom s/he is speaking. In effect, the project manager needs to be able to choose words the audience will understand, whomever it might be.

In summary, the project manager—or those in project manager-like roles—hold the key to communication challenges in these firms; and, as is later demonstrated, they also provide insights into the solutions for the challenges. However, other organisational roles provide insights and solutions to the communication challenges as well. The insights and solutions explored in Chapter 7 stem out of nuanced communication challenges inherent in the firms' organisational communication patterns and flows. The next section provides a generalised overlay of the communication flow within the firms according to the practitioners.

Organisational Communication Flow

The communication flow within the organisation gives context for when soft skills are needed. Understanding the communication flow provided insight into who is speaking to, interacting with, or avoiding whom. On the next page Figure 11 explains the communication flow in diagram format. The communication pattern has been divided into phases or stages in obtaining and managing a client's project. The data for each phase was collected through the interviews as participants described their typical work day or week. These phases add context to the communication tensions, the possible conflicts, and how the tensions and conflict may be reconciled. This communication flow chart outlines three distinct communication phases and highlights the central role of the client; and, the importance of the project manager or small firm owner. Also, note the warning sign between the developers and the client.

Figure 11. Web Development Communication Flow

Phase One. The first phase in the communication pattern in small web development firms was centred around the selling and bid processes. During this time, the potential client determined if the web development firm can provide the web related services they were seeking. The interactions during this phase of the client-firm relationship happened primarily through the salesperson. Once the client had agreed that the firm can meet their needs, the communication events transitioned from sales person and client to project manager and client.

Phase Two. Phase two of the communication pattern was the transition of the client to a contractual partner. The project manager acted as the primary organiser of communication and guided the project to completion. During this phase, the contract was signed, and the project details were negotiated. Once the details were defined, the communication flow took on the characteristics of the third phase.

Phase Three. During phase three, the client had a single point of contact with the firm. In Figure 11, this was symbolised by the client being surrounded or protected by the project manager. During this phase, the project manager, client,

and graphic designer had multiple interactions that discussed the iterations of the design of the website. Once the design has been negotiated, the developers were given the details of the project. Throughout the project completion cycle, the project manager interacted with the graphic designers and the developers. The developers would have little-to-no interaction with the client. This is symbolised by the dashed line and the warning sign. The dashed line represented the communication avoidance between the two parties; and, the warning sign represented the likelihood that the conversations between the client and the developers were the result of a website emergency. An example of a website emergency would be a bug in the code that effected website functionality and needed repaired.

Conclusion

This chapter has provided the contextual framework for the rest of the findings chapters. First, the chapter reviewed the web development process. The participants explained the development process from their perspective. These processes inform the findings chapters. Then, I defined organisational roles common to the firms. Also, I highlighted the importance of project-manager-type roles in the organisations. Last, the chapter concluded with the communication patterns typical in the firms.

The web development process proceeded as follows. Using agile development practices, the website project would begin in the firm. The project manager would meet with the client. The client would review the material, and they would collaborate on the website design. Once the collaboration finished, the project details were given to the developers. The developers would complete the project while watching for and repairing any broken code. If the website was unsatisfactory to the client, the process started again.

The web development cycle occurred because the organisational roles are performed their assigned tasks. For example, the project manager consistently communicated with all stakeholders with the exception of the graphic designer. Graphic designers consistently engaged with the client. The chapter listed three types of organisational roles: ICT roles, ICT/business blended roles and business-focused roles. As a result, each organisational role had a different focus on the project. Their varied focuses created harmony and tension in the firms. Among the organisational roles, the project manager-type roles were critical to project success because the project manager mitigated and managed the communication challenges and patterns.

The chapter also presented three phases of the communication flow. The first phase of communication was the bid process. The second phase underscored the contract negotiation process between the firm and the client. The third phase examined the nuances of the communication pattern among the organisational members. Furthermore, the third phases highlighted how all communication passes through the project manager. It also drew attention to the barrier between the client and the developer(s). This chapter was foundational for contextualising the rest of the findings chapters and suggested that a reactive approach to communicative practices could be anticipated in the firms. These firms wrestled to reconcile the communicative tensions they hoped to avoid. Where this chapter has delineated the assumptions underlying the practitioners' daily experiences, the next chapter delineates the communication tensions.

Chapter Six: Entangled Tensions

“Every day in I.T. there is a conflict. Right?”
(Interview, CIO, November 2014)

This chapter focuses on a new approach to tensions in organisational communication. The purpose of this chapter is to explore the primary research question that asks, *what are the major communication challenges and issues in small and medium web development firms?* This question was investigated using grounded theory method which examined organisational tensions presented in the data. It is therefore pertinent to first provide in this chapter a brief review of organisational tension research. The difference between what is currently known about organisational communication tensions and the tensions identified in this research led to a new approach to organisational tension analysis; this is called entangled tensions. The foundational tension on which all other tension hung was communication. Communication itself was a primary tension and was perceived as a major challenge and issue in the web development firms.

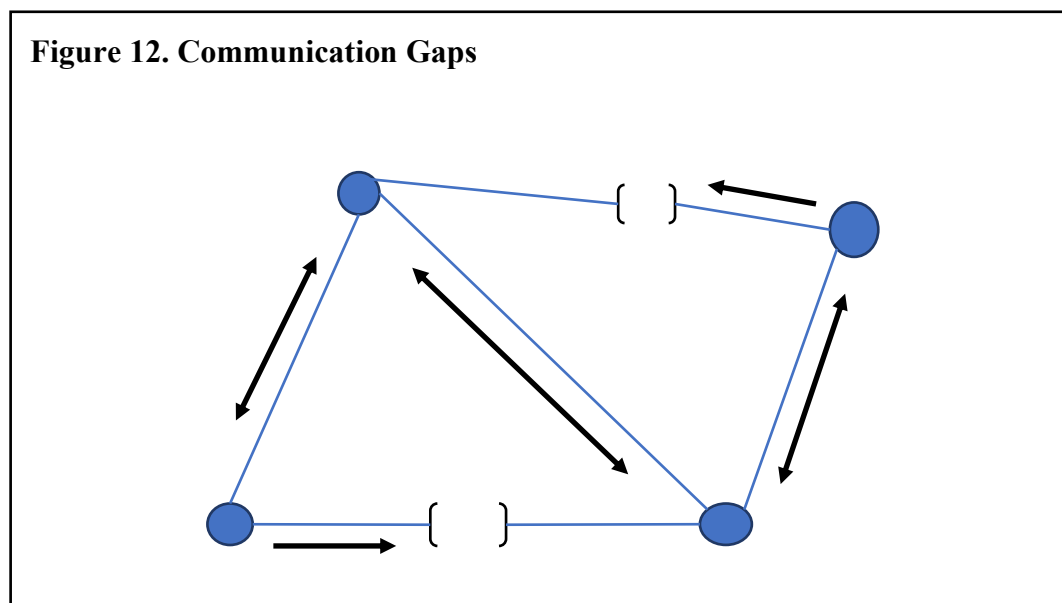
This chapter lays out the primary entangled tensions that existed in the firms starting with communication since they were the focused codes that emerged from the data. Besides communication as an overarching tension, trust among organisational members, and creativity frustrations also emerged as entangled tensions. Each chapter section will elaborate on these tensions and include a series of quotes as evidence of the claims being made. This chapter begins with the theoretical code entangled organisational tensions and ends with the role ambidexterity played in enabling communication tensions. Therefore, this chapter begins with the discussion of dialectical tensions and the entangled tensions theoretical code.

Entangled Organisational Tensions

In this research, a pole to pole grammar of separating tensions into opposites did not adequately demonstrate the complexity of the tensions identified in the firms nor the multidirectional nature of the tensions. Therefore, using a pole as the metaphor for organisational tensions was insufficient. Rarely did one *pole* pull in opposition to one other *pole* without also pulling on a third or fourth *pole*. Thus, the pole to pole grammar of dialectical tensions required a new tension grammar. The underlying tensions were much more complex than dialectical tensions such as us versus them. As a result organisational tensions needed a complex grammar that

represented the conflicts among goals and the relational conflicts such as stereotypes that were happening concurrently. The concept of dialectical tensions was too limited, and that of entangled tensions aligned better with the experience of the practitioners.

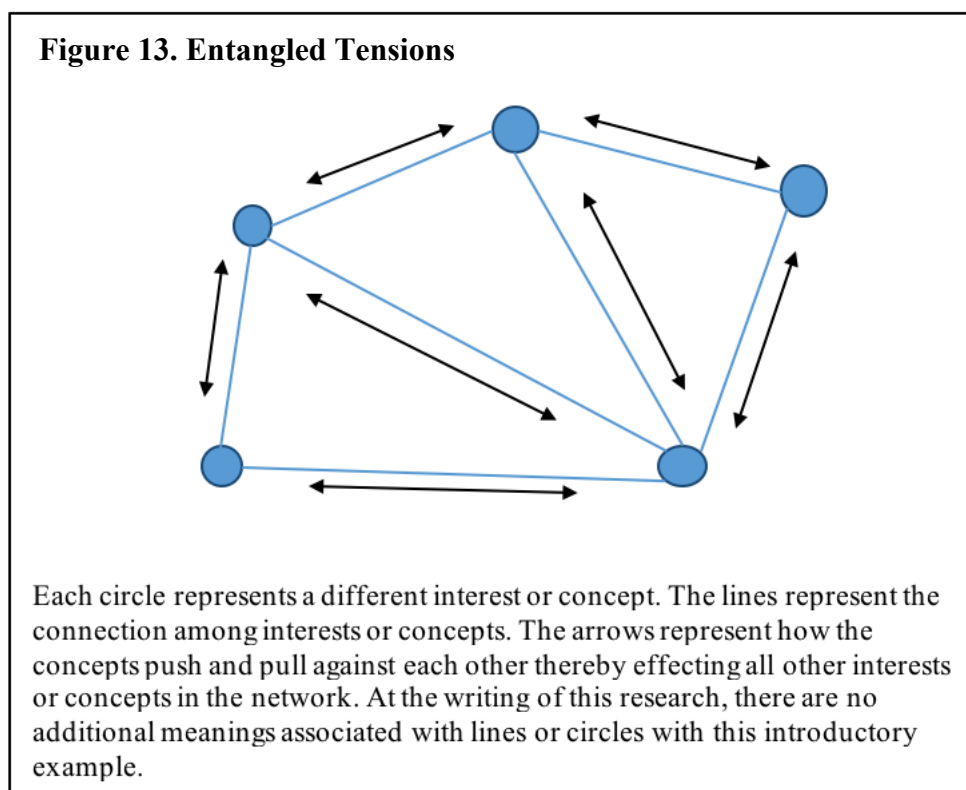
If we reflect on the three phases in the communication pattern presented at the end of Chapter Five, it is evident there were different stages of communication for the web development project. With each stage came communication gaps. These gaps are heightened communication tensions. See Figure 12 to illustrate the communication flow with communication gaps. Each node in the illustration represented an individual in the firm. Note that the arrows stop at the communication gap. This represents the inability of a message to be fully sent and/or received.



To bridge the communication gaps, a proactive, multifaceted strategy was undertaken by the organisational members. This chapter defines the communication gaps and the communication tensions that existed that caused the gaps.

The word entangled was chosen to represent the tensions within the data because the ideas and individuals in the system were all interconnected. As with dialectical tensions, there appeared to be poles. However, the poles pulled in many directions, not just one. While the tensions were layered, they were not entirely enmeshed either. For example, one project is separate from another project. However, the projects do affect each other. If a developer spends time developing one website, he or she is not developing another website. The developer is not developing all websites at once, as an enmeshed orientation to the tension would argue. Instead, the developer is pulled between which projects or tasks have to be prioritised. In Figure 13, I provide an illustrative example of this.

In this figure, each circle could represent a person, a task, *or* an idea. The lines represent the interconnectedness of the organisational roles as well as the ideas or tasks. The arrows indicate that these ideas are consonantly pushing and pulling against each other.

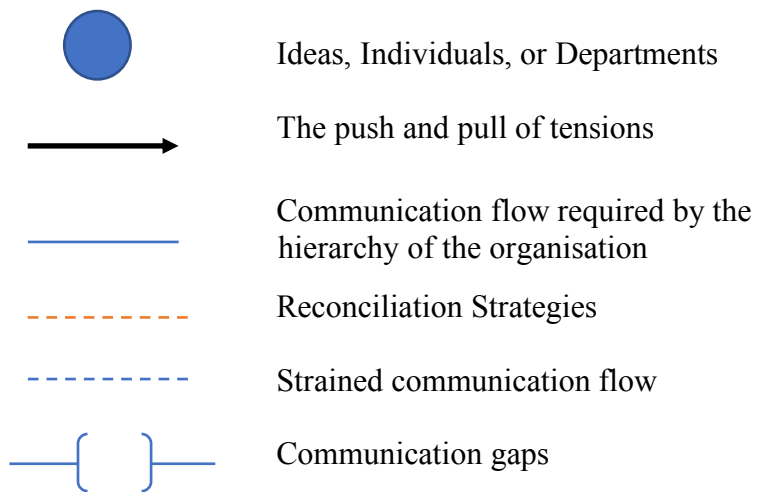


As demonstrated in Figure 13, multiple poles are pulling against each other. Therefore, using GTM, the concept of entangled tensions was developed during the theoretical coding phase to better account for the complexity of tensions in the data.

Entangled tensions. For this project, entangled tensions are defined as follows: conflicts among organisational members in defining the meaning of words, the meaning of the organisation, and the structure of the organisation. Furthermore, the confusion and misunderstandings that lead to organisational conflicts contribute to further organisational tensions that pull simultaneously in multiple directions and against the existing conflicts (Cooren, 2006; Latour, 2005; Taylor & van Every, 2000). Therefore, an entangled tension is a series of interconnected interests and meanings (or lack of meanings) that push and pull against all other concepts or interests of the organisation. Also, entangled tensions contain dialectical and knotted tensions. In other words, entangled tensions house dialectical tensions, as shown in Figure 14 below.

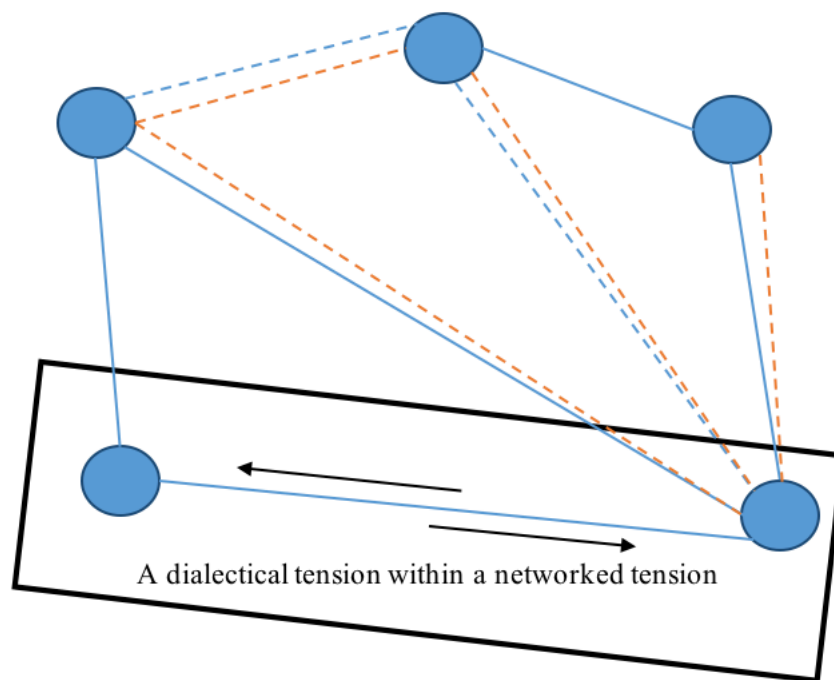
Figure 14 demonstrates another component of entangled tensions. While entangled tensions involve elements pulling against each other, they are simultaneously reconciled in the firm through communicative events. As Bakhtin (1984) argued, tensions do not exist in isolation; they exist in connection with tensions reconciliation strategies. The overarching tension reconciliation strategy is conflict mitigation through dialogue. Dialogue created shared meaning which eased the tensions, according to Bakhtin. Weick (1969, 1979, 1995) called this process sensemaking. Sensemaking is an ongoing retrospective activity to make sense of chaotic, uncertain organisational events (Weick, Sutcliffe, & Obstfeld, 2005).

Entangled tensions were a merger of two tension grammar conceptualisations: knotted tensions (Sheep et al., 2016) and entangled tensions (Barad, 2003; Orlikowski & Scott, 2015). When reviewing tensions in a spin-off of a high-tech firm, Sheep, Fairhurst and Khazanchi (2016) noticed tensions could not be represented in a linear format. The tensions were experienced as knots of tensions pulling in many different directions. Sheep and colleagues acknowledged dialectical tensions, but noted that the dialectical tension did not account for the organisational tensions specific to high-tech firms and their technology. Therefore, they argue that high-tech firms' tensions must be accounted for differently. Similarly, Barad's (2003) entangled realism argued that entangled tensions are "constitutively entangled" (Putnam, 2015, p. 707), and they are *constitutively resolved*. Using a phrase coined by Cooren (2006), the tensions existed in these firms as a *hybrid phenomenon* (p. 82, emphasis in the original), meaning organisational tensions exist, *and* the organisations also employ tension-specific strategies to ease the conflicts.

Figure 14. Legend for Figures 12-16

Therefore, in Figure 14, the legend for the following figures is presented to help the reader make sense of Figures 15 and 16 as well as to provide additional clarification for Figures 12 and 13 on the previous pages. In Figure 15, the dashed lines represent sensemaking, or the reconciliation process, that worked in conjunction with the tension. This is also significant because it is the connection between the tensions and the constitutive communication of organisations. Sensemaking, or resolving the chaos, is part of the CCO process (Taylor & van Every, 2000). To review, entangled tensions are tensions that house knotted and dialectical tensions that pull in many directions simultaneously while the firm members work to resolve the entangled tensions.

Figure 15. Dialectical Tensions within Entangled Tensions



This figure demonstrates that dialectical tensions are important and are included in the boarder definition of networked tensions. Also demonstrated are the simultaneous balancing strategies occurring alongside the tensions.

Communicating about organisational tensions. In the data, the need to stabilise the tensions was perceived as essential to organisational success. Notably, when the participants shared their experiences of working in small and medium web development firms, the tensions were described both as dialectical tensions and as entangled tensions. True to dialectical tension grammar, some tensions in the data were defined as pole versus pole. For example, Layla [CIO, #16] began her interview with a dialectical tension. She said:

Typically, in the I.T. industry, there is an us versus them mentality. Depending on whom you talk to determines who *us* is and who *them* is. So, a lot of time we are trying to get to the same place and are saying the same thing. We are just saying it in different ways [line 63-65].

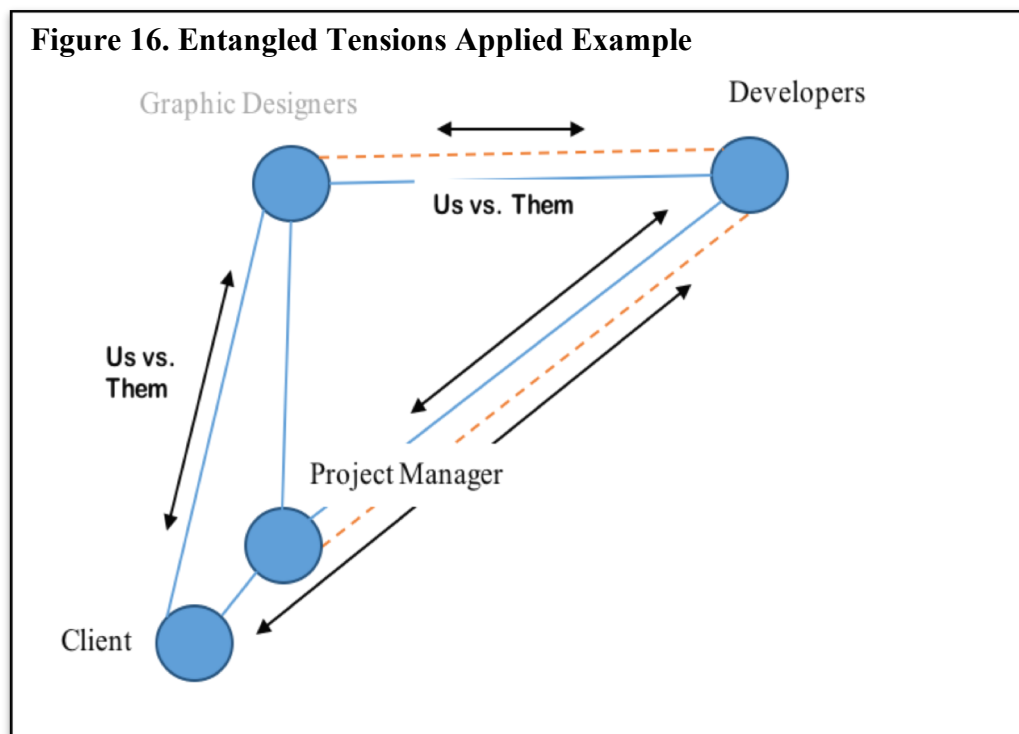
Ward [CIO, #29] voiced a similar perspective using a dialectical format.

With the I.T. guys, they believe they are doing things the *right* way. For the business side, they sometimes want the *right* things and the *right* way; but, doing the *right things* can be two different opposites [lines 113-116, emphasis in nonverbal tone].

In contrast, entangled tensions were entangled in the stories told by the participants. Michael [project manager, #10, line 154-157] provided a succinct example when he said:

We talk a lot about grasping the technology [with each other about clients] and understanding what the [clients] are saying, but I think a lot of people forget what we do. That's the biggest complaint I hear from developers, "They don't know what I do."

In this example, the primary communication tension is the client's lack of knowledge about the web development process; again, a lack of shared language. For clarity, the entangled tensions mentioned by Michael are demonstrated in the diagram on the next page. In Figure 15, there are three groups of people: the project manager, the developers, and the clients. The knowledge-level of the clients about the development process affects both the project manager and the developers. Also, in Figure 15, the project manager and clients are represented by two overlapping circles since the project manager acts on behalf of the client for the firm. Also, note in the example that the graphic designers were included in the model even though they are not included in the quote.



In other words, entangled tensions are interconnected dialectical tensions where many poles act for and against other poles simultaneously. Figure 15 highlights the tensions but does not account for the nature of the tensions. The point of this illustration is to show that dialectical tensions apply to a myriad of situations

and overlap to affect other organisational members. In fact, Figure 15 only presents the parties involved and does not represent the layered ideological tensions which are also likely to exist in these situations. Also, entangled tensions are entangled in the organisational experience and are balanced within the organisation. Given the complexity of the tensions and how they emerged from the data, the entangled tension analysis process was both a finding *and* a method.

Table 12 below shows the entangled tensions extracted from the data. The entangled tensions were combined focused codes within the entangled tension category. The bulk of this chapter discusses these entangled tensions in greater detail, with the tension around communication, being addressed first, followed by trust, creativity, and ambidexterity.

Table 12. Entangled Tensions Categories

<i>Entangled Tension Categories</i>		
Tension Title	No. of Participants	No. of Incidents
<i>Communication</i>		
Predetermined communication—Strategic communication	4	4
Reactive—Proactive Communication	2	2
Strategic communication	13	22
Communication avoidance	7	15
<i>Trust</i>		
Us vs Them	10	29
Talking to business people vs. Developers vs. every other department in the firm	14	51
Local—Global	6	11
<i>Creativity</i>		
Creativity—Management Control	5	6
Creativity—Client Control or Client Expectations	1	6
Saying no—Saying yes	7	7
<i>Ambidexterity</i>		
Quality—Completion (getting it done!)	5	9
Product Development—Project Development	3	3

Communication

Communication was the first focused code within the entangled tensions theoretical category. Communication was assigned a multitude of meanings. The conflict of meanings appeared early in the research, and the primary dialectical tension this involved was *communicating versus avoiding communication*. However, communication was not only a dialectical tension; it is an entangled tension because it is interwoven with, and pulls on, *all* the other tensions identified in this research. This tension emerged from the data as participants repeatedly expressed the desire *not* to communicate with clients or management; or, the desire to withhold information. In other words, metacommunication practice in web development SMEs were its own tension. For the participants in this study, communication avoidance was connected to the constraints on the time and scope of their projects. The more time a firm spent communicating about a project, the fewer people perceived that work on that project was being done.

Communication avoidance. Seven participants recounted 15 detailed experiences centred on their employee's desires to avoid communication. Scott [CIO/Developer, #19] was a perfect behavioural example. The organisation he worked for was headquartered in Lehi, Utah, but, his office was located in Mexico City, Mexico. He signed the ethical consent form to participate in this research and would lament in emails, "I want to interview. I am ABD ["all but dissertation" in the United States PhD educational process]. I know how important this research is" [email #3]. Time and again, we would schedule interviews, but his work would take him away from interviewing until he finally answered a few questions through email. As my interactions with Scott demonstrated, communicating with an *organisational outsider* got in the way of work. While he was not intentionally avoiding me, his work demanded communication avoidance with anyone outside of the organisational unless it was related to the growth of their firm.

In contrast, some participants and firm members were intentionally communication avoidant, like Grace [graphic designer/small business owner, #1, line 371], who stated she would prefer not to communicate. Understanding this research was about communication patterns and challenges, she hesitantly said, "The least amount of communication possible, the better." The reason avoidance occurs is because communication with a client or co-worker about the technicalities of the work was perceived as a complicated process. As demonstrated in the last chapter, the first phase of the communication patterns began with the sale of the

service and continued through the contracted project. The quotes below demonstrate how the firm members perceived communication a complicated process.

When a potential customer says, “Does it do this?” The way that a salesman would read that is, *that’s really important to this client. I need to get as close to that as possible*. And so, [the salesperson] will say, “Well this is what it does”, and *the trouble is the client always hears what they want* [Liam, marketing manager, #25, lines 10571061, emphasis added].

I had a customer, who asked for us to provide a service to them and we told them clearly what the service was. They didn’t really listen and that happens a lot. People filter. They hear what they want to hear [Jeremy, small business owner, #20, lines 104-106].

As Jeremy and Liam explained, communicating about the technical aspects of the job was hard. Grace said, as little communication as possible is preferred. Since communication avoidance was preferred, the act of communication itself became a tension.

Sean [small firm owner, #24] gave an example of communication tensions for small business owners and the inclination toward communication avoidance. He said:

I have hired people, [and] the typical engineer is an introvert. They don’t want to talk to customers. Like I had people that I hired in Hawaii, and I say, “Okay, I need you to go do this.” He says, “I don’t need to talk to anybody.” And I say, “Yes, you are going to have to talk to the people there.” He said, “I don’t do that;” and, I’m like “Okay, well, then that’s not going to work” [lines 395398].

There are several important points in this quote from Sean. To begin, Sean is stereotyping his developers. The stereotyping of developers and developers stereotyping other organisational members became an important communication challenge. Stereotyping is discussed in further below on this chapter. Then, Sean is demonstrating how communication avoidance is a challenge with his employees and implies how it affects his relationships with his clients. Finally, he emphasised the need to persuade his employees to communicate because it affected their organisational success.

The communication-centred conflicts, like the one experienced by Sean and his receptionist, were evident in other interviews. Stereotypically, developers are communication avoiders; however, the data demonstrated differently. The quotes above are from a graphic designer, a small firm owner, and a sales manager. David [CEO, #6, lines 220-222] provided another example:

I'm here; it kinda gives me some time, people can't ask me questions all the time, so it gives me [silence] so, I can do more strategic things; I can crunch numbers and plan to make sure we are staying on track.

David was explaining how time away from his small firm was a relief. David was Scott's counterpart; Scott was mentioned earlier in the chapter as an example of how difficult it was to get interviews in small firms. Scott was located in Mexico City, Mexico and David was located in Lehi, UT, United States. When he is in Utah, David did not worry about communicating, which allowed him to "do more strategic things." In this quote, David was not avoiding communication, but demonstrating the perceived burden of communicating.

Sebastian [developer, #11, lines 138-139] echoed David's reasoning for communication avoidance. He explained that talking to people meant he would not be able to focus on writing the code and meeting the deadlines. The comments by Sebastian, David, Sean, Scott, and Grace showed that communication avoidance stemmed from a lack of desire to explain the web development process, and a desire to stay focused on their respective tasks. This pattern of communication avoidance aligns with research in Corporate Language Based Communication Avoidance (CLBCA). Notably, in CLBCA, the employees of different languages avoided speaking with one another because the language translation seemed too difficult (Lauring & Klitmøller, 2015). As mentioned, the principle was identical: departments avoided speaking to each other in high-tech firms because translating the technical information was perceived as complicated and difficult.

Whether organisational members preferred to communicate or not, a portion of the daily tasks are devoted to maintaining relationships with the client. When communicating with clients, web development firms often choose to withhold information from the clients. They withheld complex technical information from the clients because it was difficult to translate into common language the client would understand. Such information included how complicated developing a webpage can be. Withholding information was another form of communication avoidance. The following quotes illustrate interviewees avoiding the disclosure of certain information:

I feel like there are some things you communicate to the client intentionally and somethings you don't. Uh, because we work in a very technical industry. Sometimes getting too into the nuts and bolts will actually do you a disservice, a little bit, because they may not understand; or you'll say, like, we can do this but it will take this long; and, they're just like, "But it seems so easy!" and then you have to explain to them, "here's why it's not that easy" [Steve, small firm owner, #4, lines 46-52].

We build websites for people; we do online marketing for people; we do—we can get really technical, but that’s why they’ve come to us. They don’t want that. So, we just tell them what we hope the end result will be [Jeremy, small firm owner, #20, lines 153-156].

Of the seven interviewees that referred to communication avoidance, each one agreed it was easier to disclose as little information as possible because the client typically had marginal knowledge about how the web development process worked.

The organisation-to-client relationship can be further strained when the developers became involved with explaining the development process. While developers are the most knowledgeable about the project (McConnell, 1996), their communication skills are perceived as underdeveloped because of stereotypes and the highly technical communication process. Such stereotypes are illustrated in the quotes below.

A developer is not going to go off and explain an issue to a customer because it’s not what they do. And I think it’s just the brain of the developer, so to speak, commonly doesn’t compartmentalise communication the same way as somebody who is doing it all the time. Or, they may not anticipate [what the client needs to know]; they are going to assume this if you say that [Steve, small firm owner, #4, lines 51-54].

The engineering guys are more about getting it done, so they have a very different approach on communication style [Erik, project manager, #12, lines 29-30].

Furthermore, the fact that some developers preferred not to be engaged in the communication of the firm implied another form of communication avoidance. In the group interview with the developers, they explained why interfacing with the clients was challenging for them.

Trying to communicate what we do, ‘cause it’s like talking to a mechanic like you don’t really know, or you might not know all the things that they’re talking to you about. And so, it’s trying to express those things to someone who has no idea what you’re doing. And so, a lot of times they’ll expect something that maybe we can’t do or, they’ll promise something that can’t be done, because they don’t know the limitations like we do [Alex, developer, #30, lines 62-67].

I don’t think it’s good for the contract for me to try and communicate with them, [the clients] ‘cause I tell them what can and can’t be done when they expect that something can be done.
[Sebastian, developer, #11, group interview, lines 144-146].

The person who can read the level they are being talked back at instead of talking over or under their level; instead of making them feel stupid or making them feel super smart, right? The IT person that has the

communication skills that can read their user and get to the root of their issue will be the most successful [Michael, project manager, #10, lines 175-180].

In these quotes, the developers explained the difficulty in engaging a client with limited knowledge about the web development process. Alex mentioned that communication is difficult because of the technicalities involved. Sebastian expressed concern for the business contract when he engaged with the client because he was bold about the constraints he faced. He also understood how this could affect client relations. On the other hand, Michael suggested that the developers needed to know their clients, the clients' knowledge level, and then to draw on, or be taught, communication skills that would allow them to communicate instead of withholding information from the clients.

However, trying to explain or educate clients about the web development process took time which, in the view of the business owners or project managers, costs money and human resources. For small firms, these resources were too valuable to *waste on communication*. Therefore, they were extremely reluctant to increase the web development literacy of their clients. Steve [small firm owner, #4, line 184] summarised the attitude of the interviewees toward communicating with clients when he said, "We could communicate it to them; but, do we really want to?" The combination of the quotes from the developers, the project managers, and the small business owners exemplify a second layer of CLBCA (Lauring & Klitmøller, 2015); not only does communication avoidance exist among organisational members, but it also occurred in relation to the client. Of the participants who spoke of communication avoidance, most referred to avoiding communication with the client. The layers of this tension increased as the firm size increased. Instead of avoiding communication with certain organisational members, as the organisation grows, communication avoidance grew *among* departments. Layla [CIO, #16, lines 92-98] explains:

They were hired for the expertise; your technical terms and expertise are worth nothing if the people who make the money for the company cannot understand what it is that you do. Just like we are not going to take a developer and make them an accountant. They don't need to know what the charts of accounts are or what...or how the EBITDA [earnings before interest, taxes, deductibles and amortisation] calculations work. They just need to know if the company is profitable; how they can contribute to that. So, everybody has to break it down into terms that are common.

Layla explained that breaking down the technical knowledge into common language was the solution to ease the conflict caused by the organisational tensions. While Layla's philosophy proved insightful for this research, trying to get all parties to participate in creating shared meanings for their terminology was a difficult challenge. Demetri [project manager/developer, #17, lines 128-130] explained, "Often times; engineering will kind of—we actually won't share with them [marketing or management] what we are gonna build." While all departments need to be connected and clear from a project management perspective (Schwalbe, 2013), it is not always reasonable with the other constraints of the project, like cost and time.

In Demetri's and Layla's experiences with communication avoidance, organisational departments reflected a lack of desire to engage the other party in their business processes. According to the observations, this had two purposes: first, it is unreasonable for everyone in a medium-sized firm to know what is happening in all the departments. Second, from the developer's perspective, the more people who *know* what the developers were working on, the more they were inclined to comment on it. The experience represented a circular reasoning: the developers' withheld information to avoid interferences, and the management was frustrated with the developers who were withholding information. When communicating with organisational members or stakeholders, the participants seemed to perceive communication as compromising productivity.

In summary, the data demonstrated the complexity of the entangled communication tension. Initially, the tension appeared as a dialectical tension, that is, *communicating versus avoiding communication*. However, communicating pulls against three other entangled tensions: time and cost, clients and firm expectations, and organisational objectives or ambidexterity. Also, the entangled communication tension was simultaneously pulling against three different parties: the clients, the developers, and the project managers or small business owners. To further complicate this tension, the definition of what communication entailed was also unclear. Even though it was commonly assumed that communicating would affect productivity, the definition of communication varied among the participants.

Communication was a difficult concept for interviewees to define. While most interviewees assumed the interviewer and the interviewee were using the same definition, the data revealed the opposite: that is, there was not a common definition of communication. Of the 32 interviewees, nine gave explicit definitions of

communication. Of the nine, six were project managers. Of the three other participants, two were small business owners, and one was a developer. Their explicit definitions were narrow and parallel: communication is meetings. Among all of the participants, the definitions of communication were drawn from business courses they took as university students. Table 13 compares the communication definitions.

Table 13. Defining Communication

<i>Comparing Communication Definitions</i>	
Project Managers	Owners/Developers
Interpersonal Communication Skills <ul style="list-style-type: none"> • Listening • Asking questions • Sending specific messages 	Meetings
Documentation policies and processes	

Communication, for the project managers, centred on two definitions: soft skills and documentation (Schwalbe, 2013). Soft skills were defined as listening, writing well, and speaking to one another. Michael [project manager, #10, line 211] explained, “[I.T. people and developers need] to learn how to talk and write and listen.” Conversely, project managers with a development background defined communication as the documentation process of organisational procedures, otherwise known as knowledge management (Dalkir, 2011). For example, Demetri [project manager, #17, line 97-98; 104-106] explained:

One thing I see a lot in our company, we have very little documentation about how things work, a lot of it is just, we have a lot of communication pains. . . Now that we have scaled up, we have three different sites, and so like a lot of the written communication problems are starting to come up, and things were never documented.

Finally, for the owners and developers, communication was defined as meetings. When asked how the small firm communicated, David [CEO, #6, line 209-212] said,

We have a meeting on Monday, go over the goals for the week and do some training and then we also have a meeting on Friday which is sort of our accountability, end-of-week meeting. Other than that, there is not any company-wide structured meetings.

To define communication on behalf of the practitioners interviewed, three points must be included: first, meetings and other formal communication practices were a significant focus of communication practices; second, the importance of soft skills in a virtual world was critical to success; and third, written documentation to support the communication and organisational process was critical. The emerging definition by the practitioners also demonstrated how communication constituted these organisations through soft skills.

Soft skills, or interpersonal communication skills, are part of the educational and certification process of becoming an effective project manager (Dillon & Taylor, 2015; Schwalbe, 2013). The importance of highlighting soft skills aligned with the educational experience of these individuals. However, it is worth noting that soft skills occupy a distinct space in the technical world. The language and use of technical skills, for the practitioners, were perceived as an entirely separate skill set called hard skills. Layla [CIO, #16, lines 45-48] explained the difference between soft skills and hard skills, using organisational departments as her example:

It [is] interpreting jargon and technical terms to the business and also interpreting business requirements to the people who have technical competencies. You know, it's like two different sides of the brain and two different sets of jargon.

In this quote, Layla explained a myriad of organisational tensions that existed due to language, with the word *communication* being the first example. Layla described that business departments' organisational priorities and technical jargons are compartmentalised. They are separated into informational containers distinct from the jargon of web development or other IT teams.

Layla's differentiation is important since the organisational communication discipline makes no distinction between hard skills and soft skills as separate organisational communication events. This pattern is emphasised with sociomateriality (which is discussed in Chapter 8). Modaff, Butler, & DeWine (2011) defined organisational communication as a "communication-centred approach to the study of organisations," which sought to "understand the central nature of communication in all aspects of organisational functioning" (p. 2). This general definition of organisational communication is expounded on by CCO theorists who explain that communication events, of all kinds, must be included in the organisational communication experience (Cooren et al., 2011). The Montreal School's co-orientation model aligned with what the practitioners are experiencing. The co-orientation model of the Montreal School accounted for the soft skills of

conversation and the text of documentation (Brummans et al., 2014), as well as the nonhuman interactions (Cooren, 2006). Conversations were the *message exchanges* in the organisation and text was the *substance* of the conversation (Cooren et al., 2011).

As the text-conversations were tiled on top of each other and are drawn upon in distributed sites in coordinated activity, the texts, practices, and authority relationships became characteristics of the organisation (Cooren et al., 2011, p. 1155). While the practitioners may not have noticed how their text-conversation process created a pattern, it seemed evident that the conversations were *tiled on top of each other*. This was demonstrated in comments such as, “We have a meeting [every] Monday, go over the goals for the week and do some training, and then we also have a meeting on Friday which is our accountability meeting” [David, CEO, #6, lines 209-211]. Using the framework of CCO and the data, such as David’s comment, organisational communication can be defined in clearer terms than conceptualised by those participating in this research. Defining communication, as a process and practice, was confusing for the participants. As demonstrated, it was difficult to understand what communication meant to the practitioners. Organisational communication, as it existed web development firms, could be defined as a communication-centred approach to small and medium web development firms, which accounted for the technical and non-technical conversations and documentation that organised and maintained the firms through a shared language.

Lacking shared language and meanings. The participants’ confusion about what communication means was an indicator of one consistent communication challenge: the absence of a shared meanings despite their work in the same industry. The need for shared meanings was mentioned by five participants. In this section of the chapter, experiences from the five interviewees are included and analysed to provide context for this communication challenge. Two open codes were detailed in Table 14, open and honest communication and interpreting messages. Open and honest communication referred to the desire for candid and clear communication among all web development SME stakeholders. Interpreting messages were incidents in the data where the participant was trying to decipher a confusing word or inconsistency in the connotations of concepts.

Table 14. Lack of Shared Meaning

<i>Lacking Shared Meanings</i>		
<i>Lacking Shared Meanings categories</i>	No. of Participants	No. of Incidents
Open and Honest Communication	11	11
Interpreting messages	10	14

The first example came from Michael [project manager, #20] who explained his frustration with misunderstandings about popular technology buzzwords.

Buzzwords were cutting-edge technical developments that emerged in the common vernacular. Michael said:

The biggest communication problem that I've noticed is that people don't know what buzzwords they are using. It's that Internet lingo; I don't think that word means what you think it means, like *cloud*. You know, when cloud computing first came out everybody couldn't get enough of it. They didn't know what it did, but they wanted to move there because they heard other people talking about it. So, I think the biggest thing with communication is the breakdown that occurs between somebody at the management level and the system administer level where we are impacting it to try and figure out what the business need is, right? Because I.T. is really all about communicating quickly, effectively to make the business more agile. When you get caught up in buzzwords and you don't know exactly what they mean, it makes the process take longer than it needs [lines 46-56].

John [marketing manager & developer, #8] shared a similar sentiment:

Developers use a lot of acronyms; and so, you have to be very familiar with the jargon of the industry. So, some of our lower-level [developers] that aren't up to par like those of us that are more experienced [developers] send them messages, the lower-level [developers] are like, "What the heck? What does this stand for?" or "What does that stand for?" I guess that would be our biggest [issue] is the language barrier in our industry [lines 35-39].

Both Michael and John shared their desire for people to understand the basics of industry jargon. Three points from their quotes are important about having shared meanings. First, Michael noted that when a shared meaning was not established, it took longer to complete the work required of the firm. Second, John emphasised that understanding the industry jargon required time. It is also worth noting that John's quote concerned web developers and their need to learn different languages. The third point from the quotes was implied; that is, it was unwise to make assumptions about what words or processes meant as doing so could complicate the objectives the firm was trying to achieve. Sebastian [developer, #11] described his

frustration when other people in the firm assumed he knew what they are talking about. He said:

They'll say, "This doesn't work. Fix this;" and they don't define what *this* is; and, they don't define what's wrong. Or, they make assumptions about the software and how the software functions. For example, I'm at the end of the client relationship. So, one project manager had a client that was saying, "Your software is buggy and it's erroring out." Well, what they were doing is they were misusing the software to generate that error, but that error was completely logical and reasonable. So, people that don't understand the technology [are] difficult to work with [lines 93-99].

In the group interview, the Alex, Mark, and Sophia [developers, #30, 31, 32] expressed similar frustrations.

Alex: I think sometimes they think we are psychic, yeah.

Sophia: Right!

Alex: And then there's this wasted. . .

Mark, [interrupting Alex] Oh, they [the project managers] just don't know what the client want[s]

Alex: Wasted time that the client has to pay for
[lines 336-344]

Assuming shared meanings, or the context, was particularly illusive and frustrating for the developers interviewed. Several insights emerged from the quotes. To begin, and as Michael said earlier, when there was a problem with unshared meanings or context, it took longer to complete the task; and, as Alex added, it is more expensive. Also, as Sebastian explained, when the time is not spent to educate clients or co-workers on the processes needed to meet the desired objectives, it would be frustrating for everyone involved in the project. Finally, assumptions about the client and organisational needs added to the tensions that were already complicated by misunderstood processes.

Assumptions about shared meanings may be clouded by other organisational constraints. For example, Demetri [project manager & developer, #17] lamented that when their team was trying to create shared meanings with the sales and business people, roadblocks often emerged. For example:

He was "trying to explain the challenges of launching what they [the client] wanted and what time they want[ed it in]; you know were trying to explain to them [the business people], [and they were] like, they [did not understand] the technical reasons; why it's a problem; and, they're just hearing *no, no, no* [lines 42-45].

In this situation, the business people were assuming the developers were saying, "no" and they were having a difficult time understanding why the developers would say no. According to Demetri, they were unwilling to learn the information required

to understand the constraints of development. Paige [human resources, high-tech specialisation, #27] tried to explain this communication tension from a different perspective. She said: “I mean we are not engineers, the recruiting team and sales team, um, and so, they just kind of assume that we, we know” [lines 287-288].

In this quote, Paige explained that human resources, recruiters, and sales teams often make assumptions about the context and capabilities of the products the firm offers. This quote is important because it provides a different perspective on the argument that Demetri was making that “no, no, no” is all anyone hears. Paige implied, that they have to make assumptions about the process and technology to keep up with the ever-changing nature of development.

We can surmise that communication, as process and practice, is not the only tension which exists in web development SMEs. According to the experiences shared by these participants, the words they use vary and making assumptions about those words is costly. These are fundamentally issues of communication. Furthermore, it should be noted that the lack of a common language among the technical and business sides of the firms proved to be an urgent communication challenges.

This section emphasised several pivotal points. To start, high-tech organisational communication tensions need a complex grammar. A tension grammar is a pattern with which the tensions are presented and analysed. Furthermore, this section emphasised the divergent definitions of communication among firm members. It also highlighted the propensity of the firm members to avoid communication due to their lack of shared language and meanings. The avoidance and difficulty of making sense of their experiences together lead to challenges with trust among organisational members. In other words, the metacommunication practices directly and negatively affected the relationships of the firm members.

Trust

When trust emerged from the data, it was unexpected. However, it reflected the communication challenges that centred on stereotypes and expectations. In the data, the concerns with trust and distrust were juxtaposed against the need for the firm to work together to meet their organisational objectives. In this research, I expanded interpersonal trust to incorporate organisational trust. From the data and the literature, I define organisational trust as the belief that two vulnerable parties

(individuals, teams or small departments) can engage in a place of cooperation and reliance to achieve organisational goals.

Trust among co-workers was interwoven with other concepts, like stereotypes, physical proximity, arrogance, and humility. Therefore, this thesis focused on two of those concepts, namely stereotyping and expectation violations. Trust, or a lack of trust, affected the ability of the firm members to communicate with one another that resulted in a myriad of stereotypes, conflicting organisational priorities, and suspicious behaviour among departments about the respective business and web development processes. Layla [CIO, #16] described this challenge in her own dialectical tension, *us vs. them*.

Typically, in the I.T. industry there is an us vs. them mentality. Depending on who you talk to determines who *us* is and who *them* is. So, a lot of time we are trying to get to the same place and are saying the same thing. We are just saying it in different ways [lines 63-66].

Layla's observations were a result of 16 years of leadership in the high-tech industry. While she discussed the ways in which she encouraged her teams to overcome this trust barrier, the data showed that it was difficult to achieve. Table 15 represents the dialectical tensions data that comprised the communication challenges that effected trust in the firms.

Table 15. Trust Challenges

<i>Trust</i>		
<i>Trust Code</i>	No. of Participants	No. of Incidents
Us vs Them	10	29
Talking to business people vs. Developers vs. every other department in the firm	14	51
Local vs. Telecommunter	6	11
Arrogance vs. Humility	1	3
<i>Total Incidents Concerning Trust</i>		94

Trust, or a lack of trust, was aggregated by several other tensions. The first tension was us vs. them, as detailed above. The second tension was local—global. This tension incorporated the relationship challenges when organisational members work remotely. The third tension represented the developers and their difficulty communicating with other departments in the firms. Seventeen of the 31 participants discussed this conflict. The 94 incidents were stories, statements, and inferences about the problem. Initially, us versus them was perceived as a

dialectical tension because it was drawn directly from the data. However, the data revealed an entangled conflict which was difficult to resolve. These complicated, interwoven conflicts became the hallmark characteristics of entangled tensions.

Repeatedly the sentiment was expressed, “I think the biggest thing with communication is the breakdown that occurs between somebody at the management level and the developer level” [Michael, project manager, #10, lines 51-52]. Or, as Kevin [project manager, #14] bluntly explained, “The tech teams don’t like the business people” [lines 16-17]. Layla, Michael, and Kevin represent the common belief among the participants that us versus them is really the tech people versus every other department. Mark [developer, #31] explained why there is a communication division and a relational disconnect, “they [management] don’t know the limitations like we do” [line 67]. Alex [developer, #32] agreed with Mark when he explained that the confusion among the departments and/or individuals, “happens like every day” [line 75]. When Mark and Alex spoke of limitations, they were defining it in several ways. According to the data, limitations for the developer came in several forms: time, knowledge, client demands, and organisational expectations—each of these tensions pulled in opposite directions simultaneously on their roles in the organisation. The perceived disconnect among the developers and everyone else translated into distrust among organisational members.

Time was also mentioned as a major challenge for developers, and as a contributor to distrust. Sebastian [#11, developer] said:

The professional service side of the business [or the business people] and the engineering side of the business have a hard time understanding why something can’t be done or shouldn’t be done [125-127].

Misunderstanding the development process in the organisation complicated the already existing tensions. Mark [developer, #31] said, “Usually they [management] tells us how long it is going to take for us to do it [lines 77-78]”. However, management may not understand that the code the developers were writing could require the developer to spend time learning more about the emerging technology; or, management may not account for the other deadlines required of the developers. When multiple deadlines were imposed upon the developers, the deadlines become impossible to achieve. Kevin [project manager, #14] said:

In the firm, there needs to be a clear translation process among the developers and the business people and a methodology. Otherwise, walls form between the development teams and the business teams which creates a lack of trust. The lack of trust develops into micromanagement—they

become hypersensitive and the tech team can't move fast enough to be able to help explains that the result of these situations is a lack of trust [lines 26-29].

Jeff [small business owner, #18] exemplified the distrust and tendency to micromanage in a subtle statement, "We needed to make sure they [the developers] were held accountable" [lines 77-78]. The distrust Jeff was referring to occurred after the developers in his small business *did not* test their web development reporting software. This resulted in the loss of a client after a bug in the code failed to generate a report for the client. Sophia [developer, #32] summarised it in her own words, "You know, that's all our job is, to make things look easy, but they don't necessarily realise how much effort that takes in the background" [lines 104-106]. While these examples occurred primarily between developers and management, the same challenges occurred with development and marketing and/or sales.

As CIOs, both Layla [#16] and Ward [#29] defined their organisational role as one that rebuilt or worked to maintain trust. Layla recounted an experience where an executive management member came to her frustrated because the company email was not working. She said, "When I got here, the tech team was struggling with the infrastructure not being stable. To hell with email, they couldn't keep the servers functioning properly" [lines 68-70]. The result was that the management felt like they could not trust their developers. In turn, the developers felt they could not trust the management because they knew so little about the technology, and they would not help the developers find a solution to the server problem. Also, as Layla explained, the developers felt that the management did not trust their expert authority. In the end, Layla [#16] felt they were working toward the same goal, but neither group knew how to communicate in a language the other department understood.

In summary, distrust plagued the web development SMEs because there was a lack of understanding about the required technical processes to keep the firm lucrative. Management and other business-development oriented organisational roles did not understand the development process well, according to the developers. Conversely, developers did not understand the motivations of the business management. While this problem may be seen in a variety of organisational settings, what made this uniquely challenging were the stereotypes common to the firms.

Stereotyping. Stereotyping is a stumbling block when trying to establish trust (Foddy, Platow, & Yamagishi, 2009). Stereotypes are "a set of beliefs about

the personal attributes about a group of people” (Ashmore & Del Boca, 2015, p. 16). At the core of the trust communication challenges were stereotypes. There are three primary stereotypes: the stereotype of the developer, the stereotype of management, and the stereotype of sales and marketing teams. The most prominent conflict was found in the stereotypes that were in direct conflict with each other.

Stereotyping developers. The stereotypes of developers emerged in the interviews and *were not* part of the interview questions (see appendix A). However, when stereotypes were mentioned, I asked follow-up questions. When interviewing Michael [project manager, #10] he called the developer stereotype, *the traditional I.T. guy attitude*. He said, “The traditionally I.T. guy attitude, I think, it’s somebody who’s closed off, doesn’t know how to ask proper questions, and doesn’t know how to empathize with the issue at hand” [lines 234-245]. Sean [small firm owner, #24] added another dimension to the stereotype: “They don’t want to talk to customers” [line 396]. Steven [small firm owner, #4] explained what other small firm owners and project developer were said, “A developer *is not* going to go off and explain an issue to a customer because it’s not what they do” [lines 51-52]. The reason developers do not interface with the clients was repeatedly mentioned. Steven summed it up like this, “The brain of the developer, so to speak, doesn’t commonly compartmentalise communication the same way as somebody who is doing it all the time” [lines 52-54]. *The brain of the developer* was a euphemism for the developer stereotype. In other words, Steven suggested that the developers had a distinct communication flow different from organisational conventions.

Stereotyping the developers even extended to the way they dress, Beau [project manager, #15] pointed out. “The guys we have working here are the most hard-core developers. You know, they have the khaki shorts, the khaki carpenter’s pants; they are like, you know, the epitome of the crazy developer” [185-188]. From the data, a hard-core developer is an individual who can code in multiple programming languages. They can code the website seen by the user (UX/UI) and they can code the connections the website will need to interact with servers, networks, and manage other necessary website functions. While this seems simplistic, if the reader recalls chapter two, a hard-core developer was proficient in the languages needed for front-end and back-end development. Also, while these are evidence of stereotypes, they are also evidence of organisational identity. Cooren (2015) explained what was happening, “specific speech acts [or organisational behaviours] oft times come with specific identities” (p. 91). These

identities were interwoven with knowledge-based authority (Cooren, 2015; Taylor & van Every, 2000, 2011). Yet, the identities, authority, and communicative practices were often dismissed as predetermined sets of interactions as if the organisational members were interacting from a predetermined script.

Deterministically, these traits were attributed to personality traits. As Steven [small firm owner, #4] said, “it’s the brain of the developer” [line 52]. Lily [project manager, #23] said, “It just kind of goes down to personality” [line 181]. William [project manager, #9] claimed, “There are tons of introverts on the team” [line 213]. Or, it was metaphorically expressed by Layla [CIO, #16] as, “It’s like two different sides of the brain” [lines 47-48]. The deterministic workings of the brain were the most common metaphor to describe developer stereotypes. Liam [marketing and sales director, #25] said of their small firm CIO, “He must be half computer because that’s just how he thinks in his brain” [700-701]. Sean [small business owner, #24] and Beau [project manager, #15] extended this to all developers. Beau said these were individuals who live in “a digital, very black-and-white, binary world” [lines 68-69]. Grace, graphic designer, went so far as to say, “I don’t think communication has anything to do with it. It’s always their personalities” [lines 338-339].

How a developer thinks may not seem like a communication event. It does, however, affect communication events in the organisation. Gnambs (2015) argued that the stereotypes of developers are legitimate. Even more significant in his research was that the characteristics that comprised the stereotype were their strengths. The defining characteristic was that they are, primarily, introverts. Gnambs (2015) wrote, “the reason why the software field is dominated by rather introverted individuals might be simply due to the fact that introversion benefits programming tasks” (p. 34). While this is not a discussion on personality types and characteristics, it has been argued that personality traits such as introversion and extroversion affect communication engagement and outcomes in organisations (Cain, 2013).

Another way developers were stereotyped was how they internalised negative feedback. Oliver [small firm owner, #5] found this particularly concerning in his firm. He could not understand why the developers would personalise requests to make revisions to the websites they were developing [lines 168-171]. Max [software technical writer, #26] also mentioned this communication challenge. The developers would take criticism or requested changes to their work personally.

“You have to go into it with more of an open mind,” he said, and trust “that everybody is on the same team, working towards the same goal, that criticism is not for the person in general” [lines 586-588]. The developers did not directly speak to this stereotype. However, owning their creations was an important theme among the developers interviewed, and was part of the way they constructed their authority and power in the organisation (Cooren, 2015; Taylor & van Every, 2011). Due to the technical complexity of their work, having it critically reviewed seemed to underscore the ways in which the developers felt undervalued.

Stereotyping the business people. While the stereotype of developers was frequently discussed, there were also stereotypes of the business professionals. Again, these stereotypes underscored the *us versus them* mentality - the dialectical tension underlying the network of tensions around organisational divisions. Erik [project manager, #12] described the stereotype of the marketing people, “marketing has kind of a more stereotypical outward facing, more conscientious way about life which is, in some ways, more personal” [lines 28-29]. In this quote, there is a distinct juxtaposition between the stereotypical marketer in an organisation, as someone who is *easy* to communicate with, as opposed to the common developers stereotypes.

Sean [small firm owner, #24] gave additional insights into the business professionals stereotype, but he could only do it in contrast to the industry stereotypes. He explained that clients often tell him, when they find out he is both the small business owner and a developer, that he *could not* possibly be *technically-minded*. They say things like, “you don’t sound like a computer guy!” Sean recounted that the degree of communication proficiency is what divided the stereotypes in ICT. In other words, the stereotypes was divided by communication proficiencies that had become part of the organisational culture [lines 446-454].

Jack [small firm owner, #1] talked about *owning* the stereotype. He found, when working with other people, that they identified themselves with the common industry stereotypes. To begin, they will say, “I’m a designer, or I’m a coder, or I’m a developer” [lines 48-49]. Jack’s statements were supported by the observations I made in the firms, forums, coding education events, and business meetings. At a coding education event, I noticed that the presenters would introduce themselves using phrases like, “I am not a marketer.” Or, at the Silicon Slopes recruiting event, CEOs would introduce themselves by giving a personal history of their technical skills. It was as if their technical skills gave them credibility [Silicon Slopes Memo,

Nov 2014]. The stereotypes fed into tensions around trust and were also evident at three industry conferences I attended. For example, in one conference presentation a gentleman said, “I am a developer, even though I am going to talk about management.” He identified with a stereotype to develop ethos with his audience. Identifying with a common organisational role and the associated stereotype was related to credibility, and therefore, if the person was credible, then they are trustworthy. While identification, empathy, and credibility are their own prominent research topics, the focus of this research was the entangled tensions affected by trust. Failed expectations were also part of the entangled tensions.

Expectations. Inherent in the entangled tensions were the expectations of *how things should work*; expectations were interwoven into the communication patterns in the firms. The expectations were different for each organisational role. For example, management might have high-level expectations as defined by their vision of the organisation. This also included managements’ priorities for the organisational member. For example, when a small web development firm began working with a new client, there were expectations that the client would not fully understand the web development process. This section of the chapter outlines the communication tensions mingled with unrealistic expectations.

Jack [#2, lines 631-634] explained how a client’s expectations either worked for or against the firm. In this quote, he is comparing client #1 to client #2. He said:

So, like for client #2, I would have just barely checked-in with him; and, with client #1, I would check-in with him on every single thing that I do because I know it will save me tons of time; or, I would have to go back and start over, go back and start over, go back and start over.

In the interview, Jack explained how client #2 acknowledged their expertise by granting them independence to complete the task as they had contractually agreed; this client was flexible. On the other hand, client #1 wanted to be intimately involved in the process and expected constant communication with the firm. This contrast was one example of the expectation tension which emerged from the data. Another example was the behavioural expectations among organisational members that manifested as stereotypes.

In the following quotes, small firm owners explain the frustration web development firm members experience when clients have unrealistic expectations.

Clients will say something is broken [on the website] when it’s really not. [Then] there’s the whole bid process too. We put together a bid; here’s what they wanted; here’s what we are going to build; and, they say, “This doesn’t work.” It doesn’t work how? It works exactly how we agreed to build it.

The customer will say, “Yeah, but I thought that it should do this.” And I’m like, well, okay, you actually want it to do something different than what we had originally discussed. You have to get to what they (the clients) mean when they say “It doesn’t work” because that can mean 400 different items [Steve, small firm owner, #4, 105-110].

Clients think that features are easy to add. It’s just a check box here, because that’s what they see is a check box. But, everything that is behind the scenes that’s making that check box work and tying it to databases and string things; they don’t see that; we get that a lot [Oliver, small firm owner, #5, 160-162].

Here, the participants were describing unrealistic client expectations. As the developers explained, adding a feature may seem easy to a user, but it can be incredibly difficult to develop. Client expectations were also connected to their knowledge about the technology -as is illustrated in the following quotes by Grace, Oliver, and Jeremy:

Someone will be like, “Well, I’ve seen this on a website before and I want you to do this for me.” But, it happens to be something that is super complicated; that’s like software development. They don’t understand the difference between web development and software development. So, whenever someone gives me, “I’ve seen this and I want this” and *they think* it just comes along with a basic website, but it’s not. It’s WAY more complicated! [Grace, small firm owner/graphic designer, #1, lines 298-305].

There is a huge disconnect about what it takes to develop a piece of software, and what they think it takes to develop a piece of software [Oliver, small firm owner, #5, lines 168-171].

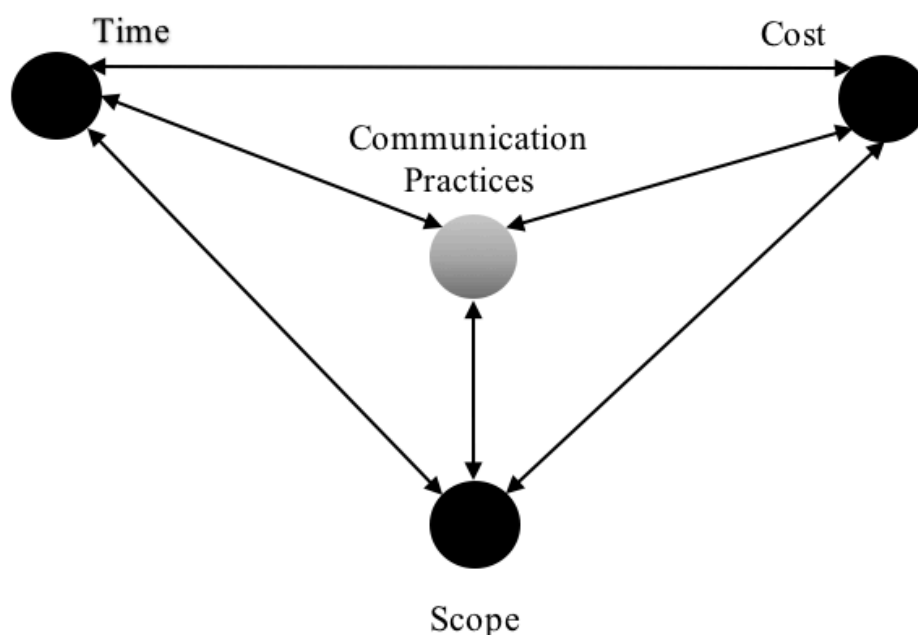
With clients, [the communication challenge] is always expectations [Jeremy, small firm owner, #20, line 44].

Client lack of knowledge about the web development process created problems. As Sophia [developer, #32] said, the job of the developer is to make the website easy to use. Because the clients have experienced easy-to-use websites, they assume websites are also easy to create. The expectation of easy website creation is a communication problem because, as mentioned earlier in the chapter, the more the firm has to explain the process to the client, or, the more they communicate with the client, the less productive the firm members feel. Having to spend time teaching the client the web development process, or to manage conflict because the development process was misunderstood, created additional constraints on the management of the project. In other words, the need to educate a client put pressure on the project timeline. Likewise, the need to explain to a client that adding another feature was not part of the original contract and is more complicated than the client may expect,

also adds to the project timeline. These are called project management constraints (Schwalbe, 2013).

There are three primary constraints in project management: scope, time, and cost. *Scope* is the objectives of the project, such as building a website. *Time* is the duration of the project as agreed on by the client and the firm. The *cost* of the project is the financial budget. These constraints pull against each other in an entangled tension and communication affects each of the constraints. Figure 16, below, demonstrates how each of the project management constraints is affected by communication practices to complete the project successfully (Schwalbe, 2013). The circles in the figure represent the project management constraints and are each connected to communication practices. The arrows, like the previous figures, represent tension among the ideas and push toward communication. To further illustrate this entangled tension, the time, cost, and scope are discussed in detail.

Figure 17. Project Management depends on Communication Practices



Time. This section outlines how the web development process, clients, and firm management affect timeframe tensions. Timeframes are an expectation conflict which happened in scenarios such as, between the firm and the client, between the development team and the sales team; and among management and all departments. Time was interwoven through all aspects of firm functions. As William [project manager, #9, lines 155-156] said, “within a lot of software endeavours the

timeframes involved cause most of the communication problems and are some of the core issues.”

The timeframe pressures in the firms were observably notable. Clients put pressure on the firm to the project manager or small firm owner, and the project manager increased pressure on the developers. Jack [small firm owner, #2, line 301] said, when describing unrealistic client expectations, “that it can take *hours* of developing and software” to get them what they want (nonverbal emphasis in the interview). Initially, time conflicts were the client’s assumptions that the project will be easy and quickly accomplished. The participants talked about strategies to mitigate this problem. For example, the firm might charge hourly rates instead of project rates, or it could create line-item invoices for the client. However, timeframe challenges still occurred.

For the developers, time as a tension intensified due to management pressure or pressure from others in the firm. Mark [developer, #31] provides an example.

[I] recently received an issue from last week that was a twenty-four hour issue; that’s what the BA [business analyst] thought it was gonna take. And the notes were so unclear, I had no idea what he wanted. And I had to thoroughly interrogate him, pretty much, to figure out what he wanted and I found out later, I mean everyday he would come over three or four times a day and say, “oh the customer wants this too and this too and this too” and I’m like “oh my gosh man”. And even as late as two days ago, there was another big piece that I did not even know about that they expected to be put in with this issue [group interview, lines 238-245].

As a new project manager, Lily [project manager, #23, lines 183-186] described her attempts to learn how to balance time constraints with development:

If I give them a deadline and they’ll, they’ll get it to back me on that deadline. There’s really no issues. Some of them I have to kinda baby a little bit. Uh, I don’t know if they just don’t, you know, they don’t write things down, or, um, or they don’t, you know, schedule things out. I don’t know what it is.

The challenges of timeframes, project management, and development are complicated. Identifying exactly how long it will take to complete a project is difficult to determine for the firm and difficult for the client to understand. William [project manager, #9, lines 113-118], with twenty years of project management experience, best describes why the combination is challenging.

When it comes to software engineering, it’s changing extremely rapidly. Frankly, developers are learning as they are doing it. It’s really hard to put a timeframe on that. A lot of times trying to estimate and deliver and all that is still kind of nebulous and that does cause communication problems. You

may say, “I think it’ll be a month and five people doing this, and it ends up taking two. That causes trust issues and all sorts of challenges in that regard.

As William articulated for the interviewees who implied and spoke of this challenge, it causes communication problems. Furthermore, he mentioned that not following through on the anticipated timeframe also caused trust issues. In short, timeframes and communication challenges are intertwined. When timeframes are affected, the communication is also affected and the project cost is also affected.

Cost. When there is a misunderstanding about how long a project is going to take, or the project takes longer than expected, it raised the cost of the project. Another communication challenge arose when the client did not have a budget to match their vision of the project. Lily [project manager, #23, lines 117-124] explains:

The budget was way out of, out of line with what they needed. So, I don’t know if that kinda gives you an example of what, what happens, but yah, they had really high expectations, but their budget was, was way low, on what they needed. Like, what kind of strategies do you use when somebody comes in and they say and you know, “This is what we want; oh wait, we only have the 600dollar budget.” Um, what kind of, what kind of strategies do you use to try to like convince them that’s actually not gonna work?

Oliver [small firm owner, #5, lines 164-166] gave another example:

Or they’ll be like, “We just want to build a site, it’s simple; it’ll be just like Facebook.” And we’ll be like, “Facebook!” They’ve spend tens of millions of dollars; I’m sure hundreds of millions of dollars to develop Facebook.

In both examples, the clients did not have realistic expectations of how much their requests would cost in relation to the budget they had available to them. Despite the existing stereotypes of developers, they also were sensitive to the cost of the projects. An example of this is in the group interview conducted with the developers:

Mark: [Management or the business analysts will say,] here’s your deadline which may or may not be realistic.

Sebastian: Exactly.

Alex: I think sometimes they think we’re psychic.

Sophia: Right. (Giggles).

Mark: And then there’s this wasted...

Alex: Oh, they just don’t know what they want; [it’s] wasted time that the client has to pay for.

Mark: If, if you make it within budget and then if you don’t make it within the budget the client won’t pay for it you know. [lines 332-347]

This excerpt from the group interview illustrated several points. The developers were sensitive to the relationship between the amount of time they spend on the project and the costs borne by the client. Also, the timeframe and cost were intricately connected, from their perception. Additionally, the expectation of time and cost complicate the tension by adding layers of conflict among the stakeholder. Lastly, how well that information is communicated, “they think we’re psychic,” further pulled against this network of simultaneous tensions. Each of these is interconnected with the scope of the project.

Scope. The scope is the big-picture needs of the project or the website design. The time is how long it will take to complete the project. Cost is the consideration and constraint of the budget for the project (Schwalbe, 2013). A small business owner or project manager will make trade-offs among the project constraints. In the project management literature, it is recommended that the manager decide which constraint is of primary importance (Schwalbe, 2013). In the data, the scope was predetermined; that is, build or maintain a website for the client. Time and cost, however, emerged as more significant expectation challenges than scope. The firms did exhibit patience with the client’s expectation.

Patience with client expectations. Notably, for the firm members, client expectations were associated with whether or not the client was a *good* client. For example, Grace, a graphic designer said a good client was a client who had, “low expectations, you usually feel really good about it.” Low expectations translated into perceived time and cost freedoms. Most important to the participants—at least those that were developers and designers—was the freedom to be creative without being hindered by other organisational stakeholders.

In summary, expectations and how well expectations were communicated impacted every stage and aspect of the project. Communication tensions resulted when assumptions were made about how much time the project would take or how much the project would cost. Expectation tensions reflected of the client’s knowledge about the web development process. Each of the entangled tensions and their complexities mentioned thus far are underscored by ambidexterity.

Ambidexterity

In this section of the chapter, the role of ambidexterity is expounded on. Ambidexterity is a firm’s ability to simultaneously pursue operational efficiency and organisational innovation (Katic & Agarwal, 2018). As Paige [human resources, high-tech specialist, line 618] said, “Priorities change daily in the

software industry.” Keeping up with industry changes required education, versatility, and proactive communication strategies. In the data, the daily changes of managing operational efficiency and innovation created constant communication tensions. Also, it was a continual topic of conversation since small firm owners fretted about technological advances in software and hardware.

Ambidexterity was a strategic management process where firm owners or managers attempted to balance these issues. Causal conversations in the firms either mediated the challenges to produce, research, and innovate, or they discussed changing their current technologies for greater efficiency. These conversations were the undercurrent of web development organisational tensions. In this research project, two communication tensions associated with ambidexterity emerged from the data, as noted in the table below.

Table 16. Ambidexterity

<i>Ambidexterity</i>		
<i>Ambidexterity</i>	No. of Participants	No. of Incidents
Quality—Completion (getting it done!)	5	9
Product Development—Project Development	3	3

Table 16 identified two dialectical tensions that are housed within the ambidexterity entangled tension: quality vs. completion and product development vs. project management and development. Quality and completion are not necessarily in direct opposition with one another. Quality meant the quality of the completed project, and specifically, the quality of the work done by the developers. Completion referred to the time by which the project needs to be done. Quality and completion can exist together. However, with agile development a rough version of the website can be published for client use with low-priority bugs, or repairs in the computer code that is less urgent than other code repairs. This introduced the difference between product and project development and how they influence the quality—completion tension.

Product and project development are slightly different. A *product* is a new service in web development which the developers and designers may create to offer to existing or future clients. A *project* is a web development product centred on the completion of work contractually agreed upon with the client. Again, these

processes do not exist in direct opposition. However, when there are only two developers in one firm, and they need to be involved in both processes, and conflicts developed.

Eight participants spoke of the tensions between producing new services in contrast to exploiting services the firm already offered. The participants explained these communication tensions from their experience even though no interview questions were asked about communication challenges and ambidexterity. Of the eight participants emphasising this tension, two were small business owners, two were developers, one was an HR representative, and three were project managers. This is important because it illustrated that ambidexterity concerns were present with all organisational roles in the firms. The project managers concerned about this tension, Michael and Demetri, were also developers earlier in their respective careers. This distinction is significant since it affects their perceptions of how management and development should work together. For them, developing a new product while trying to maintain and enhance the existing firm products were tensions of business strategy that became part of the organisational culture. The communication events that resulted from these tensions were *top-down demands* as the participants explained.

Kevin [consultant/project manager, #14], a project manager turned consultant, defined the tensions associated with ambidexterity when he said:

I.T. departments in organisations are committed with two tasks: develop something new as well as keep the current system running. The biggest barrier to these tasks is the business needs to get stuff done as well. The tech teams don't think like business people think. The communication engine in this firms was to get stuff done; while, the technology team is translating what needs to happen to meet the requirements of the business teams [lines 1419].

Kevin explained that the two tasks of creating new services or products and maintaining the current systems were an ever-present reality of technology firms. The problem, he stated, is the gap in prioritising objectives. Moreover, he implied that organisational objectives were dependent on the department in which the organisational member works. From the perspective of the CIOs interviewed, balancing ambidexterity was complex.

Revenue means something to a lot of the business people, and that is really what pays for the IT people [Layla, CIO, #16, lines 4849].

With the development guys, they believe they are doing things the *right* way. For the business side, they sometimes want the *right* things and the

right way, but doing the *right* things can be two different opposites [Ward, CIO, #29, lines 113-116].

Implied in these quotes is the priority hierarchy. Organisational priorities take precedence for the web development firm. Should exploitation of their current product take priority or should the creation of new services or products take priority? As Layla explained, revenue takes priority because the business-side writes the paycheques. Conversely, Ward described how the business and the technical people each see their priorities as the most important.

As Ward explained, ambidexterity tensions do not resolve themselves. The *inability* for the IT departments and the business departments to align presented in the data is a leadership concern. However, as Andriopoulos and Lewis (2009) wrote, leadership positions are not the only organisational roles obligated to resolve the underlying tensions of ambidexterity. They suggested the issue is much more complex, involving the personal goals of organisational members as well as how the organisation is interfacing with their client. Each of these were established as a communication challenge.

Paige [#27], an HR representative specialising in high-tech software development organisations, observed similar problems:

There's so many competing priorities because the business, the sales sides wants the business to get more money so that they can work on quality and getting more subscribers, to get more money, that way you can build up more function, functionalities, with the products. So that's what I hear all the time from that, from our engineers, is that the sales team over commits the things that they can do [lines 216-220].

Paige was referring to the marketing priorities, the developers' priorities, the sales priorities, and her priorities to manage new hires with rapid growth. She described the problems associated with ambidexterity; that is, the business side of the business wants growth through sales to increase their client base, yet the developers feel overcommitted to accomplish their previously assigned tasks. Paige discussed her concern about the toll developing takes on the web developers. Her observations were consistent with the concerns of the developers in the group interview.

In the group interview, the ambidexterity tensions and how these were communicated were seen as troublesome. Interviewees expressed these tensions in their own words:

It's all we've experienced; they [the sales team or executive management] promise stuff they know nothing about. [They] set deadlines that sometimes are realistic, sometimes are not [Alex, developer, #30, group interview, lines 89-91].

But again, they still don't know necessarily all that's involved that might seem like it's easy on. You know that's all our job is to try and make things look easy, but they don't necessarily realise how much effort that takes in the background [Sophia, developer, #32, group interview, lines 103-106].

Oh, and I think sales people are driven by like money and, so they're almost used car salesman trying to, they just want the money, so they say whatever they can do to make a sale sometimes; I think they'll do. And then they don't really end up paying for it, we do [Mark, developer, #31, group interview, lines 110-113].

As Alex, Sophia, and Mark noted, reconciling these tensions was not an easy challenge for anyone. However, it was evident that organisational members must engage in ambidexterity management strategies. In this research project, the developers were tasked with handling this difficult organisational strategy as noted by Ajayi et al. (2017), even though it is best managed by leadership (Andriopoulos & Lewis, 2009).

While Paige and Justin explained the big picture of their experience, ambidexterity issues were present in their quotes. There are other ambidexterity challenges, like sales, as mentioned by Alex and Mark. Securing sales is a necessary part of growing a small firm. Liam [sales and marketing manager, #25] described what it was like to be a sales representative and try to make sense of the competing organisational priorities:

I count myself as an honest guy, but there have been so many times when I've sold something in one way and then I'm told "Oh, but I'm talking about twelve different features." Where I've been told, "No, that's not actually what we do," and I say, "Well how am I supposed to know? This is the way I've been trained by my managers and by other co-workers who say it day in and day out." And, I'm told, you know, by the engineers who know, "that's not what we do" and I voice my frustration and say, "Well then we need to train everyone [be]cause I care about the company as a whole. I care about my colleagues and so I say, "Oh, for crying out loud, can't we train us accordingly? Can't we, you know, have somewhere to publish this information?" [lines 1116-1126].

In other words, Liam felt he was honest. However, he acknowledged that, on occasion, he sold a website product in a way that makes sense to him but did not reflect the actual website service offerings. He was not interested in doing whatever it takes to make a sale; he was selling to the best of his knowledge. At the same time, he acknowledged the confusion he experienced about the website product offerings; that is, how the developers described the constraints of the website.

Therefore, he unintentionally sold a website design or product that put pressure on the developers.

As Liam's quote indicated, ambidexterity strategies have unexpected ramifications. The communication events (Cooren, et al., 2011) complicating ambidexterity were the exchange of information among the sales people and the prospective clients; the unclear conversations among management and other organisational members; and, the interdepartmental communication that discussed the conflicting priorities of the business. Each of these communication events provides examples of the entangled nature of this tension in small and medium high-tech firms. For small firms, increasing sells in their current products were the priority, not developing new products. David [CEO, #6, lines 376-377] explained, "They [the employees in their small firm] know our ultimate goal is to get sales." Meaning, the developers existed to support the sales of the product. In contrast, Jeremy [small business owner, #20, lines 49-50] described his ambidexterity challenges, "We are growing. We are also creating new features and new technologies. So, I think it's a big part of what we do!" Jeremy, like David, implied that developmental tensions exist in their small organisations, but their focus was on the growth of their firms. This meant they were concerned with exploiting their existing technology and services.

Ambidexterity is the process of balancing the dialectical tension of exploration versus exploitation. Extrapolating ambidexterity from the strategic management literature provided additional insight into the entangled tensions in the high-tech firms. It was noted that attempts to balance operational efficiency, while innovating, heightened the communication and trust tensions that exist in the firms. It was also noted that small firms prioritised their tensions differently than medium sized firms.

Conclusion

This chapter outlined the entangled tensions found in web development SMEs. To conclude, I will highlight the primary points from each section of the chapter. First, organisational communication tensions are often presented and argued in a dialectical form following Baxter and Montgomery's relational model (1996). However, dialectical tensions did not represent the experience of the practitioners in high-tech firms. Current conceptualisations of organisational communication tensions are simple. Yet, high-tech firms need a complex modus operandi for organisational tensions (Sheep et al., 2016). Thus, I developed an

alternative approach to tensions called entangled tensions. Entangled tensions are interconnected tensions that simultaneously pull against each other. Entangled tensions extended dialectical tensions and included knotted tensions research (Sheep et al., 2016).

Communication existed as a tension in these firms. Communication was difficult for the practitioners to define. They also perceived that communication robbed productivity, and believed they would not be able to communicate effectively if they did devote the time. This leads to gaps in the communication patterns in the organisation. Complicating the concept of communication was the ironic fact that firm members avoided communication, if possible.

Communication avoidance and the organisational members' stereotypes led to distrust within the firms. Developing trust was one of the communication challenges presented in the web development firms. The trust tensions were significant because they were interwoven into every facet of the organisational experience and were constantly being negotiated. A developer may need to complete a certain set of tasks to meet the required deadline, yet an unreasonable deadline for the firm's current project may have been set. The pressure of the unreasonable deadline on the developers caused trust infractions between the developers and the deadline-setters. Disproportionate expectations and stereotypes of each other exacerbated the conflict within the firms. Furthermore, the expectations clients placed on the firm caused additional conflict. As it was argued, these communication challenges hinged on trust.

Another undercurrent of distrust and communication tensions were linked to ambidexterity. It was evident that the small and medium firms were focused primarily on optimising their firms' operations. With their limited resources, they occasionally took time to explore other technologies. Innovation for the SMEs, in this study, was motivated by their desire to expand their service offerings. With the primary focus on operation, the project management constraints of cost, scope, and time further burdened the communication flow in the firms.

The ambidexterity management strategies fuelled these tensions through the project management constraints as an entangled tension. These two processes were further *complicated by expectations* about the project constraints. Unrealistic expectations could be a lack of knowledge about the development process and it could result from the firm management, the clients, or the developers. Therefore, communication practices were needed to manage stakeholder expectations as well

as the project constraints. As a result, communication avoidance complicated ambidexterity; and, furthermore, proactively engaging in communicative practices could assist the firm in managing the ambidexterity tensions as well as managing expectations within the firm and with the clients. These entangled tensions caused conflict in the firms. However, there were specific strategies used to reconcile the tensions. They were soft skills, organisational proprioception, and sensemaking. The next chapter reviews these strategies in detail.

Chapter Seven: Reconciliation Strategies

“The I.T. person that has the communication skills [that] can *read* their user and get to the root of their [client’s] issue will be the most successful.”

(Interview, Project Manager, November 2014)

This chapter focuses on the reconciliation strategies organisational members developed to off-set the conflicts that resulted from the firms’ entangled tensions. The purpose of this chapter is to explore the research question: *what strategies are being used to solve the communication challenges which occur in these organisations?* This question was answered by extruding themes of relief or by noting the resolutions to conflict when participants shared personal stories. Therefore, this chapter provides a definition of reconciliation strategies and then delves into the nuanced differences among those strategies.

From the onset of this chapter, it is important for the reader to note that these strategies build upon each other. To use a metaphor, these strategies work in the same way a building is constructed. The building must have a foundation. In the case of reconciliation strategies, the foundation was soft skills. A building also has walls and a roof. When relating this to reconciliation strategies, the walls could be compared to the web development literacy strategies, and the roof compared to the translation strategies. With the reconciliation strategies building on top of each other, the chapter proceeds as follows: first, reconciliation strategies are defined. Then, soft skills are defined and discussed in detail. Next, web development literacy is expounded on and connected to sensegiving (Gioia & Chittipeddi, 1991). Then, translation strategies are explored as well as their connections sensemaking (Weick, 1969). Last, organisational proprioception as a skill set will be introduced. To begin, however, I define reconciliation strategies.

Reconciliation Strategies

Reconciliation strategies are strategies employed by high-tech firms to off-set the conflicts created by organisational tensions as a result of their organisational size and as a result of ambidexterity management practices. The result of organisational tensions is conflict. The conflict may be significant or insignificant. In the firm and to create an equilibrium in contrast to the tensions, firm members engaged in reconciliation strategies. The first reconciliation strategies were soft skills. Soft skills are interpersonal communication skills. In order to stay aligned with GTM, I choose to call these soft skills because it was the terminology used by the practitioners. Once a communication pattern had been established (see Chapter

Five) through soft skills, the firm members would use one of two strategies. They may engage in web development literacy or translation. Web development literacy is a form of sensegiving strategy (Gioia & Chittipeddi, 1991) specific to these types of firms, and translation is a sensegiving *and* a sensemaking strategy (Weick, 1969) which may be applied to all high-tech firms. Since these strategies are built on soft skills, these concepts are defined first.

Soft Skills

As the participants described the tensions in their workplaces, they also described the strategies they used to assuage the tensions. The foundation of these approaches are interpersonal communication skills called *soft skills* (Karmin, 2013, Laker & Powell, 2011). Each practitioner described soft skills similarly. In the data, the soft skills were coded as listening, knowing, and adjusting the conversation to the other person, or asking clarifying questions. For example, Michael [project manager, #10] explained ways in which he would encourage the development of soft skills. He said, “take a communication class to learn how to talk and write and listen; and work on the soft skills; work on empathy; work on trying to understand why somebody is frustrated” [lines 211-213]. Michael explained later that taking communication classes had a profound impact on his ability to perform as a project manager and as a developer. Table 17 outlines the types of soft skills mentioned by the interviewees.

Table 17. Soft Skills

Soft Skills

<i>Soft Skills categories</i>	No. of Participants	No. of Incidents
Active Listening	9	16
Asking Questions	8	14
Organisational Proprioception	10	21
Building Relationships	12	22

The definition of soft skills can be found in the concepts highlighted by the participants. Soft skills, in this research, are defined as active listening, asking questions, organisational proprioception—or sensitivity to the organisation—and building professional and working relationships with co-workers and clients. While the practitioners’ definitions do not include the nuances of the definitions found in the literature, they does reflect the concepts and the emphasis on soft skills. In

addition, it is implied that tension-reconciliation strategies are communication skills - further delineating the intricate ways in which organisations are constituted by communication.

Soft skills were crucial to reconciling the tensions present in their firms; consequently, the lack of soft skills was a distressful topic for the participants. It was particularly concerning for the project managers and the small firm owners. In other words, the developers were less concerned with soft skills than participants in other organisational roles. The participants whose responses were represented in the table came from a myriad of roles: HR representatives, CIOs, project managers, small business owners, as well as the sales and marketing participants. Of the soft skills categories listed, the developers were most concerned with listening, or from their perspective, being heard. Soft skills, or the lack of soft skills, generated notable discussion because soft skills were perceived as having a tremendous impact on the relationships with clients and the relationships among the individuals in the firms. These relationships were vital for organisational success (Memo D, May 2015). Positive relationships, combined with soft skills, assisted in easing the ever-present tensions in the firms. Since there were specific skills mentioned by the participants, they are presented as follows: 1) active listening skills; 2) asking clarifying questions; 3) integrating organisational proprioception; and finally, 4) building trusting relationships.

Active Listening. Active listening is the process of receiving and understanding a message and providing feedback in response to the message (DeVito, 2015, p. 170). This chapter deconstructs active listening as it materialised in the data. Nine of the participants mentioned listening during 16 different coding incidents. Even though this research and existing theory suggests listening is part of a larger process, the participants in the study felt it needed emphasised attention. Therefore, of the nine participants concerned with listening, I chose five quotes to represent the collective beliefs about listening. To begin, listening was highlighted by the CIOs and small firm owners. In their experience of leadership and entrepreneurship, listening during project negotiations was a clear way to avoid future conflicts. For example, Ward [CIO, #29, summary of lines 2586] noticed listening skills were missing from the skill sets of the clients and the developers with whom he worked. Accordingly, one of his goals was to create better listeners on his teams by teaching the developers about the clients with whom they were working. Ward helped establish a shared language within the organisation. He felt

that having shared meanings about words, processes, and personal temperaments led to greater trust within the firm and more willing listeners.

Ward noted that when the clients or developers would *hear themselves* through their own language, they listened better. For example, if a graphic designer were talking to a web developer in terms the web developer used, then the web developer would feel understood. Being able to interchange jargon among the organisational members also mitigated power conflicts from stereotypes because knowledge areas were made equal. Ward felt this was true of clients as well as developers; he said:

I believe everyone wants to be heard. I would start talking and then they would have to listen [*sic*]. Having *key words*, they talked about then they would listen better [lines 87-88].

Ward explained that encouraging his teams to use *key words*, especially key words with shared meanings among the IT teams and the clients, would create better listeners because everyone understood the conversation. As a result, the organisational objective was to create a shared language that would allow as many people as possible to understand the conversation and the process.

Steven [small firm owner, #4] also noticed how important listening was while working with a client. He said:

A lot of it is *you have to listen* to what the customer says because they will drop things on you; where they are not really telling me what they expected, but they were hinting at it. [If] You don't catch what they are saying outside of the scope, you are going to have massive problems later [lines, 138-141, *emphasis added to make more explicit*].

Like Layla and Ward, Steven explained that listening could act as a preventative strategy for conflict. He concluded that clients do not always know exactly what they want; or they hint at what they need because they are not sure what they want; or they do not know how to explain it. The client's lack of knowledge inhibits their ability to communicate about the project. Therefore, active listening skills ease the inevitable layers of tensions when working on a project with different timeframes, cost allowances, and task objectives. Notably, listening was the skill set to which Steven was referring to prevent problems and was exemplified by Ward's leadership experience. Steven's quote emphasised the critical listening issues also underscored by the project managers.

Communication skills are a project management competency (Schwalbe, 2013). Four of the interviewed project managers specifically mentioned listening as

a subset of communication skills. Two of them mentioned listening as a *central skill*.

I think one of the key words is a lot of listening; *try* to understand what people are saying, and also restating it [Erik, project manager, #12, lines 36-38, emphasis added by Erik during interview].

Listen. And I really mean *listen*. When I go into a meeting or going to meet with somebody one-on-one, I always take a note pad, and I'm always taking notes. You know I'm always glancing back at the notes. I'm always repeating stuff back at them to make sure I am comprehending it correctly. And if you do that in a way that doesn't seem disrespectful, because that is the key thing, you don't want somebody to feel like you are disrespecting them [Michael, project manager, #10, line 190-197, emphasis added by Michael during interview].

It's clarifying. So, just make sure that we are on the same page as the business [be]cause from my aspect, we support the business. Um, so, it's just clarifying and over communicating [Paige, human resources specialising in high-tech, #27, lines 605-606].

There are three underlying components to listening mentioned in these quotes: restating, trying to understand, and respect. First, both Erik and Michael mentioned the importance of restating what is being said. Restating for understanding is a critical component of active listening (Bodie et al., 2015; Rogers & Farson, 2015; Wheeler, 2016), and assists in quickly developing shared meanings instead of assuming meaning. The act of restating information during a conversation reconciled the tensions mentioned in chapters five and six. In other words, restating to create shared meanings disarms the organisational tensions that resulted when shared meanings did not exist.

Another purpose for restating is to understand. Restating what one hears could be a rote procedure. However, Erik explained the importance of trying to understand. *Trying to understand* is an act of humility and was mentioned by other participants.

I think there has to be some level of humility and willingness to walk people through, not assume they are idiots [Layla, CIO, #16, lines 134-36].

I think sometimes we get a little too [he hesitated]; I just think it's, it's good to be open minded, and uh, not take things too personally [Max, software technical writer, #26, lines 597-599].

Organisational members' humility affected the organisation as these quotes suggest (Daniels, Kay, & Skarlicki, 2017; Wiltshire, Bourdage, & Lee, 2014). The data in this thesis also suggested humility was connected to creating shared meanings.

Layla and Max supported Erik's experience when they claimed that being too defensive would inhibit the ability to understand and clarify. Michael mentioned notetaking during the conversation for documentation and clarification with the client. Michael's attempt to understand through these nonverbal strategies were another form of active listening. In this, he demonstrated his willingness to try to understand, even if it takes more time with the project. Time in development is valuable in small and medium firms (Ajayi, Odusanya, & Morton, 2017), but these participants argue that it is time well spent. Also, developers stated their willingness to take the opportunity to create shared understanding.

In the following quote, Sebastian [developer, #11] talks about his willingness to educate others on how the web development process works, *if* they are willing to listen. He said:

I don't mind getting technical with people, if they are willing to listen. If they don't shut off. I don't mind explaining how the elements of CSS [Cascading Style Sheets; a web development language] work on the three different levels of CSS. Or, the differences between browsers; or why something works the way it does [lines 105-108].

What is intriguing and ironic about this quote is the technical language Sebastian used to exemplify his willingness to detail the technicalities of the web development experience. In this quote, he referred to a front-end, web development coding language, CSS. While his intent was to describe the complexities of the knowledge and languages of computer programming, he could have also confused the listener. Therefore, this quote also demonstrated the levels and complexity within the web development experience. Beyond this insight, he provided two significant points: first, willingness to listen is mentioned again. Second, he said, "if they [the listener] don't shut off." This quote supported the point Layla and Max were trying to make as well; that is, to create shared meaning within the organisation, a supportive and open organisational culture must exist.

A supportive and open organisational culture acknowledges and respects the differences in knowledge and organisational roles and provides a space for those differences to be understood (Keyton, 2014). Furthermore, the quote by Sebastian combined the challenges of the experience; that is, it demonstrates that a willingness to understand all parties can have far-reaching consequences for relationship development bringing us to the third point that may be drawn from the project managers' quotes.

Third, and finally, trying to understand and restating the meaning was perceived as an act of respect. As Michael [project manager, #10, line 197] said, “you don’t want anyone to feel like you are disrespecting them.” Subtly, Michael was describing how trust was connected to listening. This connection harks back to Ward’s [CIO, #29, line 87] comment that “everyone wants to be heard.” One of the key points I drew from the data is the connection between humility and listening to create shared meanings and to develop trust. In some ways, listening, as a soft skill, was the foundation for the other tension balancing strategies mentioned by the participants. Additionally, it could be argued that humility is a soft skill that also supported active listening [Memo T, 8 Feb 2017]. Associated with humility and listening was asking clarifying questions, another active listening skill.

Asking questions. Asking questions during a conversation was a process of clarifying a received message by restating the message received (Daniels et al., 2017; Wiltshire et al., 2014), as Erik [#12, project manager] explained in the previous section when he recommended listening with the intent to truly understand the information that is being shared. The process described by the practitioners was a simultaneous process of hearing the client or co-worker and then clarifying the message being sent by rephrasing it or restating it. The overarching theme of this code was *does the person to whom I am speaking understand the technical terms or processes we are discussing?* Asking questions emerged as an important soft skill (Sultana, 2014).

Asking questions, for five of the participants, was the equivalent of effective communication. Below are quotes from two small firm owners. After ten years of experience in the web development industry, they discovered that asking questions was another essential soft skill. The first quote came from Jeremy [small firm owner, #20]:

Communication is often a high-level of common sense because you need to know to ask the right questions; or you know when to ask the questions. Because you may not know everything, but you’ve got to get the information [lines 210-213].

In Jeremy’s quote, there were three points of discussion: 1) question asking is commonsense; 2) the right questions matter; and 3) getting the information from the other person is critical.

First, asking questions seemed like commonsense to Jeremy. However, I suggest the phrase *seemed like* commonsense, because it is evident, from the data on the tensions, that asking clarification questions is not commonsense. When

writing on soft skills in high-tech firms, Sultana (2014) drew similar conclusions when she wrote, “Paraphrase and ask questions to learn more about what someone is telling you. This demonstrates interest and focus. It also helps you understand the situation” (p. 747). Sultana (2014) implied in her writing that asking questions is not common sense.

Second, Jeremy qualified asking questions with “asking *the right* questions” [line 210-211, emphasis added]. Michael [project manager, #10] also believed there were *right questions*. He said:

If you can go in and ask the right questions, you can avoid that [future conflict] because you can fix their problem. And, you can probably find the root issue as opposed to putting a band-aid on it [lines 201-203].

Michael explained what Jeremy implied, that is, asking the right questions meant getting to the root of the problem. Michael called them *probing questions* [line 196]. This leads to the third point from Jeremy’s quote, that is, asking questions provided an avenue to collect critical information for the project.

The last sentence of Jeremy’s quote was, “you may not know everything; you’ve got to get the information” [line 213]. The information required was the information about the personal and organisational preferences of the project or improvement on the project. If information was not clearly stated, problems occurred during the web development process. This was previously mentioned and was reiterated here to emphasise the importance of asking questions as an active listening skill.

Steven [small firm owner, #4] also noted the importance of asking questions for better client communication when he said:

I feel like I need to anticipate what they’re (the clients) going to ask and ask the developers that. It is translation, but it’s also like making assumptions. Sometimes I’ll ask those things and never actually say them to the client, I just want to have all the answers. If they (the client) ask, then I’ll tell them. So, more often than not, I feel like I get all those answers [lines 70-73].

In this quote, Steven connected the importance of asking the right questions. He asked as many questions as he could, of the developers, because he would be the one interfacing with the clients. These questions meant Steven needed to understand the details of the project from the developers’ perspective so he could *translate* the details to the client, if they asked questions. The key word is *if*, “if they ask.” This is also evidence of the inclination to avoid communication. It is worth noting because the word *if* indicated how tightly the communication flow was managed in the

firms. Also, worth noting was Steven's gatekeeping role between the developers and the clients.

The developers viewed *asking questions* similarly, but the connection between asking questions and the developer/client relationship did cause some challenges. As mentioned in Chapter Six, the assumptions made by the project manager—if a project manager *does not ask the right questions*—frustrated the developers because unclear instructions from the project manager left the developers confused which slowed down the project. In one of the memos, I wrote the following observation:

Since developers are often removed from the conversations with the client, they rarely get a chance to ask questions. Thus, they feel like those speaking on their behalf, whatever their organisational role may be, don't necessarily know what the client wants. Or, if they do know, they don't communicate it well leaving the developers asking a lot of additional questions about the client's project [*Memo D, 14 April 2015*].

This memo also provides insights connected to CCO. CCO claims a consistent, although tension-laden, flow of communication that creates, maintains, and moves the organisation forward. However, this observation emphasised another important point. In order for the communication flow described in Chapter Five to work, sensemaking must be incorporated (Weick, 1995). For example, the small business owner may understand what the client wanted, but the flow of communication left the developer in chaos and confusion. Therefore, the developer was required to go through the sensemaking process without the luxury of asking the client clarifying questions (Weick, Sutcliffe & Obstfeld, 2005)

Twenty-year veteran project manager Jameson [#28] was keenly aware of these challenges and the ways in which they affected the firm and the client. In the following quote, he gives an example of how he handled questions to assist the clients *and* the developers. He recommended starting with the question:

What are you doing today? It is an exercise. [You are asking the project stakeholders,] where do you want to be? Then you define the "to be". It's a lot of question asking. How much lead time do you want? [They will say], I want x days. They'll lay out the happy path. Then you have to drag out the contingencies. Then, you have to really drag more out of them other than what they are initially trying to do [lines 28-31].

In this excerpt from his interview, Jameson explained that asking questions was part of the sensemaking process for the project stakeholders. Since the business teams or marketing teams do not always know the specific details of what the client

wanted, the information must be extracted by asking a lot of questions. Jameson explained that the clients and sales teams lay out the general path, but it is up to the project manager “to drag out the contingencies” [line 27]. Contingencies are details and the pre-determined actions in case something goes wrong (Schwalbe, 2013). To understand the details of the project or to define contingencies, a skilled communicator must be involved. Erik [project manager, #12] supported Jameson’s experience. He said, we need “to understand why they want to do something, some way, use a lot of questions to probe” [line 94]. Erik also suggested that asking questions facilitated clear communication [summary of lines 95-97].

The clients also asked questions. From the participants in this study, the clients presented questions about the project management constraints: time, cost, scope, and quality (Schwalbe, 2013). Often, their questions were a source of angst, as argued in Chapter Six, because the firm members did not want to have to answer the questions. Since their questions were addressed from the perspective of the firm members in Chapter Six, they are not addressed in this chapter.

Asking questions was a subskill of active listening. For the participants in this study, asking questions was central to understanding the needs of the client as well as the needs of the firm. Asking questions was a fundamental part of active listening, building relationships, and understanding how the organisational roles work together to create an organisation. Asking the right question, listening, humility, and willingness also contributed to the organisational members’ sensitivity to the organisational culture and the needs of the client.

Open communication. Open communication is honest, quality communication without pretence (DeVito, 2015). Max [software technical writer, #26, lines 533-535] described open communication in these terms when he said, “at least you don’t have to live in fear, if you’re going to say the wrong thing.” Max was describing work in a firm that allowed everyone to express their perspective without recourse. The point here is that the ability to ask clarification questions required open communication and trust.

Two stories from the interviews demonstrate the value placed on open communication. The first account is from Steven [small firm owner, #4]. In this story, Steven compared working with clients to marriage:

And then maybe you call your working relationship marriage, it works out; there is open communication; like, “Hey there was a problem here” “We messed up; We’ll take full responsibility.” The ones I like, “Look, you know, I know this is extra work, so let me know what it costs.” Or, “Hey, we owe you the money, I know. I’m sorry.” And they communicate to you.

We've had customers that might owe us money, and they just ignore you for a while. I don't have any desire to be lenient in that scenario. I had a customer who, their business is very cyclical, and he's like "Yeah, I know I owe you guys this money. I have all of this in receivables." I was like "Hey, you are up front with me. I trust you; I know I'll get paid." And he paid me and we've had a good working relationship ever since, because he's always up front with me where I have had others who just ignore; and, I'm just like, sorry...and I keep harassing them. It's just like that; it's an open relationship where we talk to each other—it's the best! [lines 118127].

Steven explained the value of open communication from several perspectives. To him, open communication reflected understanding and a willingness to create shared understanding, if it does not already exist. Also, open communication promoted a more trusting and creative relationship. Finally, Steven described how open communication with clients was fulfilling.

While Steven's example provided a positive perspective on open communication, Jeremy [small firm owner, #20] described the challenges when open communication does not exist. In this narrative, Jeremy's firm has the opposite experience which led to the loss of a client.

We offer, for \$75 for the whole year [*sic*], we'll manage your domain for you so you never run the chance of losing your domain. So, if you lapse paying us, you know that it'll be there and we can renew it for you. Just be sure you pay us [he thinks for a moment] with a little grace period that we have. We are going to let you know it's still there.

So, we had a particular client who said, "Oh! You are trying to steal my domain from me!" And we are like, "For \$75 bucks! And we want a name that's branded your name?" We didn't even care. It was like a horrible domain. It's wasn't horrible, but it was their name. It's like johnthompsoninc, right? I don't want that domain. I could never sell it! It has no value to me. So, we were managing that domain for \$75 dollars. A competitor put in her ear that we were trying to steal her name.

Had we been more clear in the beginning, where we say, "Hey, you don't have to pay the \$75 but it'll be on your plate." But, then they didn't remember. So, it was a fire. We lost a whole customer over that [lines 118-133].

This experience is replete with insights. First, it reflected the strategic advantage when firms proactively attend to their communication patterns. For example, the client in this story was likely told at the beginning of the contract about the service. Yet, as Jeremy described, the client forgot. Therefore, it is helpful to clarify and restate messages to the client as part of an open communication practice. Second, by clarifying and repeating messages, the client's confusion and

attempt to teach the client the web development process in easier-to-understand terms, may have gone more smoothly. Third, because the firm was unclear about the services they provided and the details of the services, the client withdrew their relationship from the firm. Relationships within the firm or with clients sustain web development SMEs, and losing a client because of an unclear process could be devastating, especially to small firms.

Building relationships. When experienced positively, these relationships created a framework to ease organisational tensions. When experienced negatively, these relationships heightened the organisational tensions. Relationship building seemed to ease the tensions by providing a framework for asking clarifying questions as well as engaging in other behaviours that would increase organisational proprioception, as defined in the next section. Below are four quotes from participants describing the importance of building relationships. Each participant has a slightly different perspective about what relationship building means; however, the important point is they demonstrate the value of the relationships.

If you take the time to build personal relationships with your clients, you will find that the communication enhances greatly. You are no longer the IT guy; you are a friend and trusted advisor. The downside is when they need help with their home computer, they come to you; that's also an upside. You are the person that they go to. You've built that relationship and people trust you. You are on a first name basis with them [Michael, project manager, #10, lines 166-171].

[The new developers are in a place] where they can just get a lot of face time that way they have a relationship off the bat. It's just easier in future communications that like the kind of guru that I have them spend time with knows their face and has a little more empathy for them, when they're trying to get more of their time later, in pursuit of tracking down a problem or something like that, that's one thing and we're just making sure they have relationships with sort of the key people [Demetri, project manager, #17, lines 146-151].

I want to build a relationship with you [*sic*], and have a good, um, you know, a good working relationship with them. You need to have a good relationship with them, but it's very much a client um, service relationship with them [Lily, project manager, #23, lines 198-199, 207-208].

It depends, the one thing that I've noticed in the computer world is that people are more likely to keep their computer guy if they know them and they're friends with them. So that relationship is really important [Laura, small firm owner, #22, line 123-125].

As Demetri emphasised, knowing a co-worker or client's *face* was meaningful. This was particularly notable because their work environments are

primarily online, in front of a computer screen instead of working with individuals in person. From the quotes, it appeared the research participants used technology to expedite their tasks; yet, they valued face-to-face interactions.

Ward and Layla [CIO, #19 and #16] used strategies to create common ground and build trust. This was the case with many of the project managers as well. Beau took a unique approach with his team that exemplified the creativity when managing organisational tensions. He said, “They [developers] exist in an online world. They really like tasks in communication. It may feel petty to a marketing person to try and couch a brief in those terms” [lines 163-164]. In other words, to find common ground with developers and for developers to find common ground with business people, an appropriate approach must be used. Layla brought her developers into the business world; the project managers brought the business world to the developers through other strategies.

Beau [project manager, #15] provided another example of using common ground. He explained that business people can task orient their communication to create common ground with developers since they, the business people, typically do not understand the highly technical world in which the developers lived. To find common ground, he created gaming-style objectives by interweaving project management with popular gaming entertainment. Just as one would receive a mission while playing a video game, the first thing Beau would do was explicitly define the project. He would carefully delineate the precise items that needed to be done. Then, he would expound on why each item needed to be done. After that, he explained how the project would be used. Finally, he would set clear criteria to let the team members know if they have successfully achieved the project objectives. Beau, like Layla or Ward, noted that a common ground approach assisted with the trust dynamics of the organisations. His approach, like the others, revealed the subtlety of creating a common language for firms that are imbued in technology creation.

Soft skills were a combination of different communication skills. According to the data, soft skills comprised active listening skills centred on asking clarifying questions. Being sensitive to the organisational system was critical and supported the relationships and the need to reconcile the organisational tensions intrinsic in web development. When contrasted with hard skills, or technical skills, soft skills were foundational to the other skills web development firms needed for success. The other strategies were web development literacy and translation.

Web Development Literacy and Translation

Translation and education are similar, yet different, procedures. However, the end goal was the same - to create shared meanings (Memo O, 2 March 2016). From the data, I defined *web development literacy* as the process whereby organisational members and clients became oriented to the small or medium firms' work by learning *what* technologies were used and *how* they were used. In many ways, web development literacy is a sensegiving process (Gioia & Chittipeddi, 1991). Sensegiving is primarily a leadership strategy; it is a one-way process of making sense for organisational members by giving the definition or meaning of an experience to another person through communicative practices such as stories, texts, or mission statements (Gioia & Chittipeddi, 1991). In some situations, sensegiving does not work. In these cases, firm members attempt at sensemaking strategies (Weick, Sutcliffe, & Obstfeld, 2005). In the case of web development firms, the sensemaking strategies were called translations.

When compared to web development literacy, the translation process was equally as important. High-tech *translation* occurred when the high-tech language or development process needed to be re-explained to make sense for an individual illiterate in high-tech language(s) or processes. Like authority and trust, literacy and translation emerged from the data and were not anticipated during the literature review. In the firms, literacy and translation happen simultaneously, but are different in approach and purpose. The quotes below were extracted from memos written about the translation and literacy process wherein I define what I was observing in the data.

Translation demonstrates the specific ways organisational members create a shared meaning out of an unshared language heavily driven by an ever-changing high-tech industry. This code houses both the problem and the answer to the communication challenges which exist in high tech firms. *The translation process occurs in two directions: "top down" translation where forced meaning is given and a "bottom up" translation where meaning happens organically* (Memo O, 2 March 2016, emphasis in the memo).

In this quote, I explained a phenomenon I noticed in the data. That is, there were two ways to create shared meaning: *top-down* translations and *bottom-up* translations. Top down translating was when the meaning of words, events, or organisational procedures were given by management with no input from organisational members (Sheep, Fairhurst, & Khazanchi, 2016). Bottom-up translation was when shared meaning happened organically through shared

experience by all organisational members (Kukko, 2013). Bottom-up translation practices were coupled with educational practices. As the coding process continued, I noted the following:

As I am reviewing the data, it is increasingly evident there are two processes happening at once. Initially, I thought it was just a translation process. However, there is an education process as well, an attempt to increase web development literacy, wherein the clients or co-workers are being educated about the development process to increase understanding among all of the stakeholders working on the project (Memo 1N, 15 March 2016).

An example of the literacy and translation process and their simultaneous functions came from Jeremy [small firm owner, #20]. Jeremy spent a great deal of his interview educating me on their leadership-oriented organisational culture and then explained the importance of every employee being a leader in the company. He was educating me, or increasing my literacy about their organisational culture; and then, he was translating what being a leader *looked like* in his firm. He said:

Here at our company, we don't like to hire just anybody. So, if someone doesn't have skills or experience we are okay with that *if* they have leadership qualities. We know they'll get the skills and experience, so if they have core attributes: leadership, communication—a leader. That's the number one. They are proactive. They want to go after information. They are entrepreneurial; they are innovative—the things I mentioned before. So, they are honest. They have integrity [line 68-73, emphasis in vocal tone during the interview].

In the interview, Jeremy also mentioned his desire for his clients to be leaders; in other words, he wanted his *clients* to become familiar enough with the web development process to decrease the amount of time his firm spent translating the project. In the interview, when he recounted the communication challenges he experienced with clients, he explained how a client-leader looked different from employee-leader. He said, “We don't have as high of an expectation of leadership [of our clients] as we would with our employees” [168169] implying he still expected some proactivity from his clients.

These examples demonstrate literacy and translation processes. To begin, Jeremy expected his employees and clients to have a basic knowledge of the web development process. Next, if they did not have the educational level needed to perform well in the firm or to have an education conversation about the project, he expected them to gain the knowledge they needed. Both of these situations involved web development literacy. Then, translation occurred when he would explain the development process to his employees or clients using metaphors or some other

language where shared meaning already existed. The following quote was an example:

“Do you want a swimming pool?” “Yes.” “Okay, how big? How deep? Do you want a slide or a diving board?” You know, we will cover the high-level vision for you, but we will get into the technical of how we are going to excavate and put in infrastructure and rebar and the mechanicals and the electrical. . .right? That’s exactly what we do. We don’t get into the HTML5 of the CSS3, unless they ask. If they are savvy, then we’ll get into it a little more with them. Otherwise, we’ll just tell them the end result [lines 156-162].

Jeremy translated the process of development to his clients in a way they could understand. At the same time, he expressed frustration when his clients were too active in their role with the firm. This minor conflict reflected the entangled nature of the tensions, and in this case, the expectation tensions. Jeremy’s firm provided a *representative example* of web development literacy and translation as they proactively attended to the tensions and constraints in the firm. Becoming web development literate is an *educational process* where practitioners inform and teach others the information about web development and organisational culture.

Knowledge management for increasing web development literacy. As explained in the last section, a common method for encouraging organisational literacy was knowledge management (Heavin & Adam, 2013). Building organisational literacy was the process of educating a stakeholder about how the firm worked, informing clients of the precise services of the firm, and the associated specifics of the services offered (Hughes, 2014). In these firms, organisational literacy was a detailed understanding of web development. Explicitly, to be web development literate (WDL) one must have a basic knowledge of the development process. Although it emerged in the data, yet given the scope of this research *and* the expansive knowledge management (KM) discipline, KM will be addressed in its basic forms: explicit KM and tacit KM.

The basic types of KM are defined as: a) explicit KM is organisational knowledge that has been captured in a tangible form; and, b) tacit KM, although slightly more difficult to define, is the knowledge that resides in the minds and habitual practices of individuals (Dalkir, 2011). Dalkir (2011) defined tacit and explicit KM by their varying properties. Tacit KM is “expertise, know-how, know-why, and care-why” accompanied with the abilities to adapt and collaborate (Dalkir, 2011, p. 10). Tacit knowledge is shared through face-to-face mentoring or training.

Explicit KM is “disseminated, reproduced, accessible” and is a transferable knowledge through “products, services and documented processes” (Dalkir, 2011, p. 10). Whether tacit KM or explicit KM, knowledge management is communication management (Twietmeyer, Lyth, Mallak, & Aller, 2008). It is management of the talk and text of the organisation for organisational success (Taylor & van Every, 2011). The four participants concerned about explicit KM were project managers. The other participants concerned about tacit KM were a mix of project managers, developers, and small firm owners (see table 18).

Table 18. Knowledge Management Literacy

<i>Knowledge Management Literacy</i>		
<i>Knowledge Management categories</i>	No. of Participants	No. of Incidents
Explicit	4	8
Tacit	7	15

Explicit knowledge management. Explicit KM was a common concern among project managers. See the following excerpts from the interviews:

There is a huge problem with documenting processes correctly [Kevin, #14, project manager/consultant, line 31].

One thing I see a lot in our company, we have very little documentation about how things work, a lot of it is just, we have a lot of communication pains around just growing up as a company [Demetri, #17, project management, lines 97-99].

I think that most of the challenges I see are developers not understanding that the things business people might be nuanced. They will literally read a requirements document or a mission statement and take it very literally. So, whereas, the person who wrote it will think it indicative of the type of things that they want. The developer will see it as code. It is instructions. [Beau, ##15, project manager, lines 69-75].

These quotes characterise the need for explicit KM which is important for organisational literacy. The first characteristic was the firm needed documentation for future reference, no matter the firm size. The second characteristic was that the documents contain the processes needed for organisational growth. Kukko (2013) argued that writing down the firms’ processes was part of the organic growth inherent in high-tech firms. Demetri [project manager, #17, lines 97-121] explained that managing explicit knowledge was the link between the developers and the other departments in the firm—even if the firm is small.

Tacit knowledge. Tacit KM was the knowledge shared in the firm in casual conversation. During such conversations, the organisational members would share their technical knowledge or ask another co-worker to explain their knowledge. As Michael [project manager, #10, lines 76-77] said, “I think what really needs to be done is people need to take the time to learn the technology.” Michael’s experience suggested that understanding the technology, or having some literacy about the web development process, provided a decreased need for translation. This statement does pose another problem, however. Not everyone can know everything about the ICT landscape. It is too comprehensive and changes too fast. While it would be ideal for those working the technical side of the industry, not even the developers know or understand all the complexities of every computer coding language [Memo W, 4 Oct 2016].

When reflecting on KM, educating the clients happened in tacit forms during key communication interactions such as negotiating a contract or when explaining the services the firm offered. The need to increase client literacy emerged with the 10 small business owners interviewed. For the clients to improve their web development literacy, they had to ask someone in the firm questions. It was during these key communication moments that the education process would be initiated. The consensus among the small firm owners were that their employees did not have the time to educate their clients. Yet, despite the declaration of their time constraints, each of the small firm owners recounted a situation when they were willing and able to increase the tacit knowledge of their clients about the web development process.

Clients were not the only receivers of tacit knowledge. The developers also needed to gain tacit knowledge from each other and experts in the field. As a result, another part of developing organisational literacy and tacit KM was acknowledging the constant learning curve of the developers. As technology changed and updated, they were required to learn new information to perform in their organisational roles and maintain their cutting-edge knowledge.

Another part of tacit management was the way in which developers were constantly learning to perform in their organisational roles. The next quote came from a memo written after I attended a Silicon Slopes conference. This section of the memo illustrated the need for increased web development literacy for all parties engaged in the web development process. It also emphasises the importance of KM in developing organisational and web development literacy.

Developers must stay on-top of the code as it changes. This was implied, but came mostly from observing the Silicon Slopes conference. When a free opportunity to be part of an online learning community was offered, the conference attendees, mostly developers, were electric with excitement. This moment captured the need for developers to stay literate about technology changes, and it displayed an interesting crossover of explicit and tacit knowledge. It is explicit in that the developers are using captured knowledge to function in their roles, yet they are learning it individual. Since it is not part of the organisation's database of knowledge, any information a developer learns will become tacit knowledge for that developer for their day-to-day know-how to perform their specific role which benefits the organisation [Memo W, 4 Oct 2016].

Explicit and tacit knowledge management strategies aligned precisely with the Montreal School's notion of CCO. Explicit KM directly relates to the artefacts which comprise the organisation (Anderson, 2004; Kuhn, 2008; Taylor & van Every, 2011). The Montreal School of CCO called this "authoring through textualization" (Brumanns et al., 2014, p. 177). Tacit KM communication events aligned with the "collective experiences" of organisational members since it forged a "network of practices and conversations" to create shared meanings and language (Brumanns et al., 2014, p. 177). Knowledge management, in many ways, is an attempt to organise and make sense of internal organisational communication practices and enables organisational literacy for organisational members separate from time and space. However, literacy enhancing opportunities are limited.

When constraints of time, scope, or cost are manifested as conflict, organisational literacy would not be the best option for easing the organisational tension. The project may need to be completed at a certain time for the client, or the client may desire specific services which the firm knows are more complex than the client can perceive. In other situations, it may be that an HR representative in the firm needs to know who to hire, but doesn't fully understand the requirements of the potential candidate. Or, a sales person may believe they understand the details of the product they are selling, only to find out they do not fully understand the details of the product. In these cases, the sensegiving strategies of organisational literacy were not working. Therefore, the communication events transitioned from sensegiving to a translation, a process of combining sensegiving and sensemaking.

Translation. The high-tech translation process was comprised of sensemaking strategies, such as using metaphors (Maitlis & Christianson, 2013; Weick, 1995; Weick, Stuclicke, & Obstfeld, 2005) These strategies were used to clarify the needs of the stakeholders when the development process was deeply

confusing. Each of these parts of the translation experience worked together to address the communication gaps of the entangled tensions. Drawing on the work of Searle (1969, 1999, 2010), Cooren (2001) explained organisational “translation [as] an operation that consists of standing for something else” (p. 182). In these firms, the translation experience was the process of taking another language and reformulating it to represent something that made sense to the audience. In other words, it was taking computer coding languages, translating them into spoken language, and then reformulating the spoken language of the coding language into a message which could be understood by all stakeholders. Therefore, translation, in this case, is a process of taking complex computer codes and transforming it into a meaningful experience for another person through sensemaking and sensegiving strategies. Max [software technical writer, #26, lines 48-49] described this process in his own words in the previous section when he mentioned that technical writers needed to interview the developers with the intent of translating the software development product into English, or a spoken language.

To provide an example of the difficulty of this process, Figure 17 (below) is a screen shot of computer code written in JavaScript, a coding language. This illustrates the complexity of coding languages and demonstrates that they needed to be translated into spoken languages. It also illustrates the complexity of code and the potential for the type of chaos and confusion that required sensemaking. To continue the example and expound on the complexity, the code in the screen is an example of compressed code created through software automation. This code is not intended to be readable by a human. In a compressed state, it is also difficult for a proficient developer to understand; yet, compressed codes allow for complex web development designs to work efficiently and quickly.

development knowledge. There are symbols upon symbols in coding and spoken languages which needed to be clarified for the development process to be adequately understood by those involved. This complexity also demonstrated why organisational members felt *communication avoidant* when explaining the complexity of the process in terms that were understandable to everyone involved in the project.

Using Figure 17 of the compressed JavaScript code with its explanation provided context for the translation process that happened in web development firms. Translations were specific ways organisational members co-constructed a shared meaning out of an unshared, ever-changing, high-tech language densely influenced by the innovations of the industry. The translating process housed both the problem tensions and the answer to the communication challenges which existed in the firms. This was demonstrated in the literature on language translation processes and CCO (Bencherki, Matte, & Pelletier, 2016). Bencherki, Matte, and Pelletier (2016) argued that multilingual organisations are becoming normalised, an example from this research was Ali's multinational web development firm. The researchers further claimed that multinational and multilingual organisations developed differently because multiple languages constituted the reality of the firms. Applying this logic to organisations comprised of high-tech multilingualism, I argue that these high-tech firms communicated themselves into a different reality than SMEs outside of ICT. Therefore, this definition extended the research on language translations in CCO in the organisation to include organisational translations and workplace literacy as discussed in the next section (Bruce, 1999; Cooren, 2001). Imbricated languages led to communication tensions that required an educational process to increase web development literacy. As web development literacy increased, other translation strategies could be applied to make sense of the multiple languages present in the firm. Like the tiled tensions and layered languages, reconciling the conflict and chaos in the firms requires an imbricated response (Taylor, 2011; Taylor & van Every, 2014). The response to the entangled tensions began with making sense of the situation.

Translation and sensemaking. Sensemaking was a theory of creating meaning from chaos and confusion in organisational life (Ancona, 2012; Taylor & van Every, 2014). Taylor and van Every (2014) defined sensemaking as three components that involved a *purposeful* activity. These three components were an actor, an acted-on, and an interpretation of what was happening. Sensemaking was a

multifaceted theory used to provide clarity during organisational uncertainties. In this project, it was consistently applied to the translation process for reconciling organisational tensions. For example, sensemaking provided a ready-explanation of why tensions existed in organisational life and what was gained by making sense of the tensions. Also, sensemaking was helpful to the organisation when it requires organisational members' collective action (Weick, Sutcliffe, & Obstfeld, 2005). As Taylor and Van Every (2000) explained, "Sensemaking is a way station on the road to a consensually constructed, coordinated system of action" (p. 275). In other words, sensemaking was the process of creating shared meanings.

Sensemaking aligned with the translation process and CCO as it brought meaning to communicative behaviours of individuals who attempted to create and maintain organisations through collective actions. In the terms of CCO, meaning creation during the sensemaking process emerged as a communicative event (Cooren et al., 2011). "Sensemaking is, importantly, an issue of language, talk, and communication" and it relied on the "interplay of action" (Weick et al., 2005, p. 409). Weick, Sutcliffe and Obstfeld (2005) wrote an article exemplifying and redefining how sensemaking worked in organising. Sensemaking organised flux; it started with chaos and change. Then, sensemaking noticed what was normal and what was not through an interpretive process. It acknowledged what was out of order and needed to be realigned for organisational success. After norming, labelling occurs. Labelling was the process that acknowledged what was in chaos by creating a treatment to be applied to the chaos. It is the behaviour employed to correct the problem. Next, sensemaking was retrospective and about presumption. While it was easy to "portray sensemaking as more cerebral . . . sensemaking starts with immediate actions, local context, and concrete cues" (p. 412). Finally, sensemaking was about action and communication. It answered the questions: *what is going on here? What do I do next? Who else needs to be involved?*

Using Steven and Oliver [small firm owners, #4 and #5, summary of their interviews] as an example demonstrates the sensemaking and translation process. First, a client came to their firm who needed to have a website built. This individual has no-to-little experience building a website. Therefore, the project began in *chaos and change* for the client. This was an example of chaos and change because the client has no experience making sense of the technology on their own, hence they needed to seek experts. Second, and after the contract was signed, the client started to notice other websites and made assumptions about what was *normal* for website

appearance and development. As a result, the client requested Steven and Oliver's team to add additional features to their website, such as a button. The development team rejected adding a button to the website because it would derail their other code by adding complexities and risks to the code. The request of the client created chaos for the developers.. Sebastian [developer, #11, lines 141-142] explained the sentiment from a developers' perspective. "It's not like we don't want to do the work; we are just unwilling to modify the foundation of the code because of a client whim." Therefore, the developers were unable or uninterested in taking those risks. At this point, Steven or Oliver labelled the chaos by negotiating with the developers and managing the request of the client. This was done by taking actions with both parties to find common ground (Priem & Nystrom, 2014). During this time, several communication strategies were employed, such as explaining the problem of adding a button to the website to the client in a metaphor. Finally, all of the parties involved asked *what is going on here?* or *what information needs to be clearer?* Thereby, sensemaking fully engaged the translation process through when they clarified the chaos by creating a common language for the high-tech terminology.

Examples of the sensemaking process in the firms was evidenced in their narratives during the interviews. It also suggested that the sensemaking process was dependent on organisational roles. For example, a developers' experience would be different from a small firm owners' perception about how tensions were presented and were solved by the firm. In other words, developers lamented that no-one seemed to understand what they do or the limitations within which they worked. Yet, from the salesperson point-of-view, the developers are *narrow-minded*. They made sense of the developers' behaviours by assigning them labels or stereotyping them. The following quotes provide examples of this sentiment:

A lot of frustrations occur on both sides because neither of them [can] effectively communicate with each other [Beau, project manager, #15, lines 47-49].

If you see IT people who have hopped back and forth between business roles and IT roles and a bunch of other things. They are the ones that have broader business and communication training [Layla, CIO, #16, lines 180-182].

These two quotes represented the tension around communication and a lack of shared meaning. It was necessary to use sensemaking strategies when a shared language did not exist. In these quotes, Beau and Layla argued that communication was frustrating because none of the teams could effectively communicate in the

firms. Then, Layla implied that training developers allowed those individuals to make sense of the communication tensions better than developers who did not have the same training. Note, however, that she was arguing that the developers were responsible for the harmony among the relationships. As a result, Layla suggested that sensemaking was the developers' responsibility. However, sensemaking needed to occur in two directions: the business-oriented departments needed to understand the basics of the development process; and, the developers needed to understand the basics of the business needs. In other words, sensemaking was improving web development literacy among all parties in the firm.

Significantly, the roles of project managers, small firm owners, or CIOs were, by definition, the organisational roles charged with sensemaking. However, according to the observational data for this study, the communication gap was wide even though the strategies for project managers have improved (Pritchard, 2013). Jameson [project manager, #28, line 10] clearly summarised the goal of easing the tensions; he said, "A big part of my job is to translate what the business wants into something an IT developer understands." Therefore, the goal of sensemaking, and therefore, the goal of translation was to reconcile the organisational tensions by providing shared meanings in a language all stakeholders understood. Yet, attempted shared meanings were confusing, and educating organisational members or clients on the basics of the development process took time which the firm leadership and organisational members may or may not be willing to take.

Liam [marketing manager, #25] explained the challenge of trying to make sense of the development process when he thought he already understood the process. This was particularly poignant because he sold and marketed the services. Note his frustration about the *inability* to make sense of the business *and* the technical sides of the firm:

I would blame because I count myself as an honest guy, but there have been so many times when I've sold something in one way, and then I'm told "Oh but I'm talking about twelve different features." Where, where I've been told, "No that's not actually what we do", and I say, "Well how am I supposed to know?" [lines 1104-1108].

For Liam, the lack of training in the development process was exasperating. He could not make sense of the situation without educational support. It effected his ability to sell and market the products.

The developers saw it from a completely different perspective, further underscoring why sensemaking and translation needed to be built into an

organisational departments' processes. Mark [developer, #31] expressed his perception of the sales and marketing teams:

Oh, and I think sales people are driven by like money and, they so they're almost used car salesman try trying to, they just want the money, so they, whatever they can do to make a sale sometimes; I think they'll do. And then they don't really end up paying for it, we do [lines 110-113].

In this quote, Mark made assumptions about the sales and marketing teams which are untrue from Liam's perspective. The contrast of Mark's and Liam's experience represents the *tensions-in-action*. Meaning, the two quotes side-by-side represented the tensioned experience among the sales and development teams. The teams believed they understood each other until they realised they were not coming from the same point-of-view. As Liam described, realising this, after the interaction was over with potential clients, was frustrating. Unfortunately, the developers did not seem to grasp the challenge which indicated that a stronger sensemaking culture was needed.

Sensemaking was the core of the organisational translation processes in the firms. It took place in interactive talk and drew on the resources of language available to the organisational members or stakeholders to formulate and exchange information through talk. As this occurred, clarification of the confusion was talked into existence which laid the foundation for future interactions for dealing with the uncertainty (Taylor and Van Every, 2000, p. 58) prevalent in high-tech firms (Sheep et al., 2016). Notably, four of the interviewees expressed that conflicts and chaos in communication and the need for a translation processes were anticlimactic. Even more significant was that these individuals were project managers trained to manage the communication gaps on their projects. For them, being able to *make sense* of the tensions on their teams defused the tensions as they arose. The process was innate to their jobs and they did not see the value of their day-to-day execution of their knowledge.

Using metaphors. The second part of the translation process was the use of metaphors. Metaphors were part of organisational life and have been a point of interest in organisational communication studies for decades (Manning, 1979; Putnam, 1982). During this research process, inductive metaphors were used by the participants (Cornelissen, Oswick, Christensen, & Phillips, 2008). Inductive metaphors are metaphors that come directly from the speech of the research participants and work as part of the organisational sensemaking process (Maitlis & Christianson, 2013). In this research, metaphors were used as a strategy to support

translation and were used to draw connections between the development process and common knowledge. The use of metaphors clarified information for all stakeholders (Sewell, 2010). In this research, six metaphors were repeatedly used: healthcare, manufacturing, maths and sciences, firefighting, car mechanics, construction, and neurology, see Table 19.

The most common metaphor used by the participants was construction. Construction was considered an observable process with an engineering element which would be considered common knowledge. The next common metaphor was neurology. I use the word neurology to represent the left-side/right-side brain. The metaphor was deterministic and connected to stereotypes. The other metaphors were used with the same frequency. In the writings on metaphors, I combined the neurology metaphors with the maths and science metaphors given their thematic similarities. To expound on the metaphors, I begin with health care metaphors since they presented with the most diversity.

Table 19. Metaphors

<i>Metaphors</i>		
<i>Metaphor categories</i>	No. of Participants	No. of Incidents
Firefighting	4	7
Production Line	2	2
Construction	11	12
Mechanics	4	4
Healthcare professionals	3	3
Left-side/right-side of the brain	5	6
<i>Total number of metaphor coding incidents</i>		32

Healthcare metaphors. The healthcare metaphor was used by three participants with varied approaches. The following quotes demonstrate the variety:

The analogy I have always used is the dentist. Nobody likes going to the dentist. If they tell you they like going to the dentist, they are liars. No acknowledges that they have a dentist appointment coming up, but man, are they glad they are there! [Michael, project manager, #10, lines 161-164].

Michael described how developers were perceived as painfully tolerated like a dentist. The second recurring metaphor was a comparison of the developers and associated information systems people to doctors or medical staff. Steven used a similar concept in the quote below.

I think there isn't a simple way for them [the clients] to understand [the development process]. It's almost like saying, "Explain to me before you do my heart surgery, like what is everything you are going to do." [Then the 'client' doubts], "Well, I'm not so sure I want to do this because what's an aorta valve." It's my job to know and yours doesn't matter, so do you want me to do your open-heart surgery or not? Maybe that's an extreme example [Steven, small firm owner, #4, lines 186-189].

If the CEO were to die, someone else would take over, but if your computers were to die, no one could take over [Laura, #22, lines 290-291].

Laura dramatically described the situation when she used the tragic end-of-life metaphor which was compelling, identifiable and was commonly interwoven into the narratives which explained the anxiety clients felt when their website was not functioning properly. In the same way a doctor saves lives, the I.T. professionals were lifesaving individuals; that is, the life of the business.

Manufacturing metaphors. Another common metaphor, particularly among developers was to compare web development to manufacturing.

Developing is like a production line, and there is an assumption that developers are creating widgets when it's actually an art [Sebastian, developer, #11, lines 829-830].

I mean I just, I see it as like a range of, a range so you start there you know, so if you took like a restaurant business. A cook at McDonald's is different than a cook at a high-end restaurant. Like and you're just going to be treated that way probably until you push yourself into that type of a place where they do respect that, 'cause I do think that is, I do think that is available and I do think there are companies that are like that and I, I think that this company was more like that before like I felt like that my knowledge mattered and what I did was important and, I was treated that way, but now, I do feel like it's I mean we're just flipping code here; like as fast as we can, like no one cares [Alex, developer, #30, lines 847-855].

In both of these quotes, the developers were explaining their work experience. For the developers, morale was low in the firm. However, as Alex described, there were better organisations to work for. Having an avenue to voice their frustrations was a method of creating harmony within the conflicting approaches between management and the developers. Even though the metaphor devalued the developers, they hoped their concerns would be heard.

Maths and science metaphors. The designers and managers would often use maths and sciences as metaphors. Note how this metaphor was connected to stereotypes. For example:

You know, it's like two different sides of the brain and two different sets of jargon [Layla, CIO, #16, lines 47-48].

People who speak different languages can't seem to agree—kinda [need to] break it down to the lowest common denominator [Layla, CIO, #16, lines 105-106].

And I think [silence] it's just [silence] the brain of the developer [Steven, small firm owner, #4, line 52].

He must be half computer because that's just how he thinks in his brain [Liam, marketing manager, #25, lines 696-697].

The maths and science metaphors were deterministic. In other words, the participants were suggesting that developers are born differently or exist differently. Therefore, their reality was different from the rest of the organisational members. The maths reference suggested a translation strategy that was important, but was only mentioned by Layla [CIO, #16], and she only mentioned it once. To translate well, high-tech language needed to be broken into the lowest common denominator. The explanation of the high-tech experience needed to be something anyone could

understand. Notably, none of the developers used brains, maths, or computers to describe their experiences or explain the behaviour of the other individuals with which they worked. They were more inclined to firefighting metaphors.

Fire metaphors. Often, when something went wrong with a client, the metaphor was fire. See the following quotes for examples.

Then, of course, basic firefighting stuff. If something breaks [William, project manager, #39, line 34].

There's always smouldering fires all the time [Jeremy, small firm owner, #20, line 45]

To them (the clients) the barn is burning down to you (the coders) there is a little pillar of smoke somewhere because they don't know what you know [Steven, small firm owner, #4, lines 93-94].

In these quotes, fires were used in a variety of ways. First, fires or firefighters was used casually, as if they were speaking *as* firefighters. Second, they implied that it was difficult to manage the conflicts and concerns that happened with the clients at any given moment; like when Jeremy said, “there's always smouldering fires,” as if there was a major fire waiting to ignite in any given moment. Third, the use of fires and burning described the urgency of the client and not the urgency of the developers. However, the developers used these phrases to explain the urgency of the clients [see the group interview]. Oliver [small firm owner, #5, lines 91-92, summary] further clarified the intensity of the fire metaphor, to the client a *bug*—another metaphor—if the code felt like their project as going to fall apart. However, to the developers, it was just another bug. According to Oliver, the developers on his team could not empathise with the client because they did not perceive the *bug* as a *fire*.

Car mechanics metaphors. The communication process of development was often described in terms of visiting a mechanic to repair a vehicle. Using car mechanics as a comparison was an attempt to explain the expert knowledge of the developers to an individual who did not have the same knowledge level.

It's just like if I go to a car dealership. I am never going to be a mechanic. I am never going to understand . . . if someone tells me I need some widget for my car, I have, it's on me to understand. So, I ask them questions, like “What's the effect of the safety of the car?” “What is the effect on the performance?” “Am I going to do any long term harm to the car if I don't?” [Layla, CIO, #16, lines 98-103]

I think a lot of it is just um, trying to communicate what we do, 'cause it's like talking to a mechanic, like you don't really know, or you might not

know all the things that they're talking to you about [Alex, developer, #30, lines 62-64].

It's not like going to the car mechanic [Michael, project manager, #10, line 261].

These quotes described software engineering to car mechanics. Yet, not all who used the metaphor agree that communicating in a high-tech firm was similar. The first two quotes demonstrated the translation process by comparing communication about high-tech firms to communication about vehicle repair. There points are two-fold; metaphors help simplify the translation process; and, when translating, not all the information about the process is shared. However, as a project manager, Michael expressed that communicating the process was notably different than mechanics. He reasoned:

You become active participant in the interaction. And when that person becomes an active participant as opposed to a passive participant, they will trust you more; you'll build that peer relationship as opposed to that IT guy that has no people skills that everybody says, "Hey, it's my nerd on call" [lines 262-265].

Michael expressed that there was more to web development than translating the information from a computer code *language* to a spoken *language*. He claimed the purpose of the metaphors was to build relationships; and, building relationships meant returning clients and better business for the firms. Building—whether it is relationships or websites—was another metaphor.

Construction metaphors. Another metaphor commonly used were construction metaphors; such as, they needed to have a website *built*. Sophia [developer, #32, line 595] explained that construction metaphors clarified the motivations of the management at the firm for which she worked. She claimed they were *building* organisational culture when she stated, "It's building a corporate culture." In Jeremy's [small firm owner, #20] interview, he repeatedly used metaphors to translate the development process as it pertained to his organisation. He would compare development to building a swimming pool, or other forms of construction [lines 156-163]. The building/construction metaphor was used to symbolise a process with a strong system bounded by complexity and specialised knowledge.

One of the more intriguing examples of the construction metaphor came from William [project manager, #9]. Earlier in his career, William had been a developer, and then he became a software project manager. He had worked in the

industry for over twenty years. In this lengthy quote, he starts off by comparing the development process to constructing a bridge, then he stops—without any prompts or clarifications from me—and evaluates his use of the metaphor.

Like, if you took a building a bridge, you'd have the exact same problems. There's a design aspect to it; there [is] a huge project coordination aspect to it; there's conflict with budget, conflicts with staff, conflicts with the government as far as managing up. All of those exist in other engineering organisations, if you will. I don't know that those are unique to. . . just as far as coordinating software architecture, that's a challenge. The other thing is. . . actually, one area that I will say is different, not that I think about it, software is still a very immature endeavour, if you will. When you talk about laying cement, or whatever, it's so many cubic yards, so much time, doing it this way; it's a very understood thing, right? They've been doing it for centuries. When it comes to software engineering, it's changing extremely rapidly [William, project manager, #9, lines 101113].

William started with the bridge metaphor, then he stopped himself and said, “software is still an immature endeavour, if you will.” Initially, he compared software development to laying cement, a practice that has happened for hundreds of years. Then, he re-evaluated his construction metaphor and dropped it because “when it comes to software engineering, it's changing extremely rapidly,” and innovation in concrete did not change *that* quickly.

William's realisation that construction and software development are similar, yet vastly different, underscored the difficulty of trying to explain highly technical knowledge through metaphors. The metaphors also emphasised the need for trust. Often in their metaphors, the implication was expert knowledge existed, and there needed to be trust to accurately execute the specialised knowledge in the firm. While metaphors did not always build understanding, they provided descriptive ways to translate the development process. It should also be noted that the translation process needed to occur among the development teams as well. Not all developers knew all the languages or ICT processes. Individuals who were sensitive to the entire tension-reconciliation process possessed a unique soft skill called organisational proprioception.

Organisational Proprioception

When coding the data and coordinating how these tension and reconciliation strategies worked together, there was a pattern of active-reactive communication practices *directly connected to the sensitivity* of the firm or participant being interviewed. It also seemed to be part of the organisational culture since it affected the choices made within and about the organisation (Memo D, 15 July 2015). For

example, a project manager, because of his or her role in working with all parties on the project, became aware of how the sales team's actions would affect the developers or vice versa. Their awareness to the interplay between the teams and within the organisation was an organisational skill. This sensitivity to the system and the relationships within an organisation is a term I am introducing as organisational proprioception. Organisational proprioception, or any similar term or concept, was not found in the CCO literature.

Defining proprioception. The term *proprioception* was drawn from neuroscience since it was both a noun and a verb. Proprioception, the noun, is one of the body's senses. As a sense, proprioception tells the brain where one's body exists in time and space. For example, as I sit in my chair and write, I am keenly aware of the position of my body in relation to the chair, the laptop, my wireless mouse, the wall in front of me, the floor beneath my feet, and the desk. As a verb, proprioception is the movement of the body in time and space. For example, if a person is running, they are proprioceptively aware of their body in contrast to the wind, the road, their own movement on the road, and against the wind. Proprioception signals to the interconnected muscles and joints to work together and with one another. This allows the body to plan and coordinate movements. Another example of proprioception as both a noun and a verb would be a person touching their toes with their eyes closed (Amthor, 2016). Proprioceptively discerning the body in relation to time, space, and other beings or material is a complex categorisation of simulation the brain and body uses to maintain its own equilibrium (Amthor, 2016).

This concept could also be applied to the organisation. Individuals in the firm with a keen sense of cause and effect in relation to the communication flow possessed an organisational sense of proprioception. Organisational proprioception (OP), then, is the sensitivity of the departments within the systems and the ways in which they connect to each other. An individual, a department, or an organisation could possess OP. Having OP would be demonstrated by planning and successfully coordinating activities among the group, department, or firm while simultaneously acknowledging the strengths and weaknesses of each individual or team.

Therefore, the definition of *organisational proprioception*, from the data, meant the ability and skill to sense what was happening in the organisation, identifying how organisational members' roles worked together to successfully

achieve organisational goals by noting insights into the character and interests of the organisational members and their ability to work with the clients and each other (Memo V, 12 Dec 2016). Furthermore, it meant sensitivity to the communication patterns and flows in the firm and their consequences when enhanced or disrupted. While the echoes of systems theory exist in OP, it appeared to be a pre-existing condition to systems theory as well as contributor to soft skills proficiency. It was a type of organisational consciousness. Furthermore, it could be argued that an organisation constituted by communication must have organisational members accomplished in OP. In other words, the organisation must have members who care enough about the organisation's survival to make sense of the organisational tensions, to proactively reconcile the tensions, and to understand that communication flows and patterns would affect both tensions and reconciliation. The data demonstrated OP was more than a familiarity with the individual(s) to whom one might be speaking; individuals with this skill understood how all the departments and systems in the organisation worked together and how one conversation affected the entirety of the system.

The first quote to demonstrate the interconnectedness of OP comes from Ward [CIO, #29]. In this quote, Ward talked about the audience to whom his IT team was speaking. Yet, as he described his experiences, he described a skill that included knowing the other department, but also how the members and departments were interconnected to create the whole organisation. He explained it in these terms:

The first thing is you need to understand is the audience. You don't have to know their topic, but you do need to understand the type of people they are. So, this is hard for engineering people. I.T. people are not as hard [*sic*]. Engineering people are strict, very strict, and very structured, and very intelligent. When I am communicating with those structured kind-of-people, you can't fool them. You can't make things up. You need to be well prepared. You need to be some prepared. You need to study what they want to achieve. This can be applied to most groups [lines 115-20].

Ward used a stereotype for engineers as an example. In his quote, he says, "you need to study what they want to achieve." Studying what the client wanted to achieve was effectually studying the system within which the client was working. Ward argued that this approach could be applied to all groups of people. For Ward, having his developers *know* who they were talking to—meaning, their role in the organisation and understanding their knowledge base and how all of this fit into the client's IT needs—was critical to their success as a team because it directly affected

the clarity of the team's messages to other departments/clients. In a memo, I wrote the following as I analysed the early patterns of organisational proprioception:

Knowing the audience was a skill set incorporating individuals with strong interpersonal communication skills that allowed the individual to connect with other co-workers or clients at the co-worker-client knowledge level [Memo V, 12 Dec 2016].

Bambacas and Patrickson (2008) suggested, in their research about interpersonal communication skills at work that understanding the relationships and systems in the organisation, or with clients, is one way to create commitment and connection among employees and/or clients. Organisational proprioception, as described here, defuses organisational tensions by creating a relationship founded on sensitivity to the concerns and objectives of co-workers and clients (Wheeler, 2016). Layla [CIO, #16] described a similar, yet different, approach that further illustrated the nuances of OP. She said:

You know your technical people know what they are doing; you know your business people know what they are doing. So, you have to look at how every single person sees that problem and sees that solution before you start acting on it. You have to make sure you have all of the facts. And, if you leave someone out who is important to the problem-solving, you'll know pretty soon; because, as soon as you go to implement something, there is going to be one group of screamers, and they are going to be the ones you left out. You have to know your organisational structure. You have to know who is representative of each group and go talk to them and get the information [lines 161169].

Layla outlined five key points to organisational proprioception. One, trust must exist among the organisational members to accomplish the organisational objectives. Two, like Ward, she recommended an understanding of organisational structure by understanding how each team, individual, or client perceived and solved problems. Three, collect all the facts from the departments/individuals involved. Four, by collecting the facts, an awareness of all the individuals affected by the problems should emerge. Five, and finally, she said, "go talk to them and get the information." In this concluding comment, Layla argued that this process was underscored by *talking*, or communicative practices.

There were three project managers whose words illustrated organisational proprioception in their own terminology. They said:

The I.T. person that has the communication skills, that can read their user, and get to the root of their [the client's] issue will be the most successful [Michael, project manager, #10, lines 179-180]

You have got to create a communication plan early on in the project!

Plan how to document the project and plan how to communicate!
 [Kevin, consultant/project manager, #14, lines 69-70]

The key is to understand how each group thinks about their problems; what they are trying to solve; I think, there is always, you might have a different way to approach a problem, but the other team approaches their problem for a very specific reason [Erik, project manager, #12, lines 91-93].

The project managers' perceived soft skills, or interpersonal communication skills, as important, and in their experience, it was central to the success of the project. Each of the project managers quoted here claimed that knowing the people with whom they were communicating was a tremendous help. Each one provided an insight into organisational proprioception from the project manager perspective. Michael, like Ward, suggested that knowing the client was going to create better connections that would lead to successful project completion. Kevin recommended creating a clear communication plan at the beginning of the project thereby establishing a sensitivity to the communication pattern. Like Layla, Kevin implied that gathering the facts and including everyone in the communication plan from the on-set of the project reconciled tensions later. Erik acknowledged the differing approaches to problem-solving; and, that when problem-solving approaches are understood it was easier to solve the problem instead of complicating the conflict around the problem.

From these three quotes, the nuances of organisational proprioception are demonstrated. We can see that; organisational proprioception was a communicative practice. In other words, an individual cannot increase their sensitivity to the organisation, the teams within the organisation, and the clients unless they communicate with others. It was also evident that, communicating with the intent to learn about the other persons or teams could lead to greater understanding among the groups that, in turn, would enhance problem-solving approaches or reconciliation strategies in the firms. Finally, organisational proprioception was an understanding of the organisation, its relationships and systems, and how those relationships and systems worked together to complete organisational objectives.

From the data, it was also evidenced that *a lack of organisational proprioception* caused challenges in the firm. From the data, human resource representatives and developers noticed that others had steep learning curves about the organisational culture and how the departments worked together in the organisation. In other words, these participants were keen to notice a lack of organisational proprioception. The first example came from Ruby. Ruby [human

resources, high-tech specialisation, #7] told the story of hiring developers for the first time and the learning process required to adequately complete the task. She described her experience:

One of my favourite success stories is we had no idea what we were doing and we were trying to recruit and we were calling people off of CareerBuilder, and we were sounding dumb because we didn't know what we were doing. So, we really had to reevaluate. My co-worker and I, being the dorky researchers that we are, researched all of the qualifications that these people needed. And sometimes you have to do that because you don't know what kind of job it actually is and you can't find the right person if you don't know what you are actually hiring them for. And so, we researched for a whole day and we got our notes and came together to see what we needed. And immediately we were able to find candidates with the right qualifications [lines 2029].

Ruby's experience explained the organisational proprioception learning curve. She was new to a position and needed to hire developers. She explained how unclear she was about the qualifications and what exactly was required. This demanded that she do additional research and gain knowledge about the industry standards and development languages. After she gained the appropriate knowledge, she hired the right people. Ruby labelled this experience as a success story for her. Her increased knowledge and sensitivity to what the organisation needed proved to be necessary to successfully complete the required organisational objectives.

Successfully learning about the specific requirements needed to complete organisational objectives was a common practice for Paige, a veteran high-tech HR representative. She described her experience in the following quote:

So, I've just had to get very specific information and I'm just learning on top of it. So, like I know enough, where I can go to a different team now, and they'll just give me the buzz words that they need [Paige, human resources, high-tech specialist, #26, lines 140-142].

While Ruby and Paige both described learning and adjusting to the firm to be sensitive to what the firm and teams needed, other project managers expressed hesitation in learning the organisational proprioception process. Beau [project manager, #15] provided a contrasting view. In his interview, he suggested that learning organisational proprioception is different for everyone. He said:

Let me tell you stuff that doesn't work first. Trying to get developers to empathize with the audience. It never works. We've tried taking them to off-sites and having them experience who their customers are and getting to know who their problems. None of that ever works. And, I am going to throw a glib comment here, the place where I got my undergrad in Scotland specialized in the UX challenges presented by people with disabilities trying to use information technology. So, that was their specialty area of research;

and, my emphasis of my undergrad; and my [stops to correct himself], the professor who led the entire department's firm belief was that truly amazing developers are blessed with a touch of Asperger's. You know, he was sort of joking and who were sort of true, but you could really tell the guys who came through his department who were going to be really, really good coders because they were the ones who had a hard time communicating in real life, right? [lines 145-156]

Beau's quote was insightful for three reasons. First, he explained that there are consistently different approaches to organisational proprioception for developers. Second, he described that most developers needed a precise, rules-based communication system with a logical explanation about how relationships and systems worked together. Third, he created a what, why, and how to measure the approach to increase his developers' sensitivity to the organisation.

Laura [small firm owner, #22] also believed developers required a different approach to increase their organisational sensitivity, or proprioception, toward clients. She said:

The developers can ramble off all these things, but then the person [the client] doesn't quite understand; and, so then they're [the client] too afraid to ask, so they take hours trying to understand what it is [or what the developers are explaining] [lines 23-25].

In a memo reflecting on this section of Laura's interview, I wrote:

Laura believed developers *know too much* and are not sure how to communicate their knowledge in any other way. She noticed in meetings when a client "doesn't quite understand, and so then they're afraid to ask, so they take hours trying to understand what it is" that the developer was saying. Many of the interviewees, all of whom were small firm owners, argued this is exactly why developers rarely interface with the clients (Memo 4A, 16 June 2016).

The quotes about developers and their organisational proprioception reinforced the inclination the firms had toward tension and division. Laura provided understanding by implying that the developers know the technical terms so well that it is difficult for them to gauge if they are simplifying the terminology enough for the clients or, I would argue, their co-workers. However, as Beau described, there were solutions for creating organisational proprioception with developers, such as using the *what, why, and how it is measured* strategy. I argue that removing developers from the opportunity to communicate deprived them of opportunities for organisational proprioception.

To recap, organisational proprioception is a new concept I have created to describe a process found in the data that was different from organisational culture. It

offered a way to explain a nuanced sensitivity to the ways in which the relationships and teams in the firm worked together to plan and coordinate the successful completion of the organisational objectives as well as solve problems. Developing organisational proprioception assisted in reconciling the web development firms' inclinations toward communication avoidance.

Conclusion

This chapter covered the strategies firms' used to mitigate the conflict caused by organisational tensions. The key points of this chapter were that organisational tensions do exist, but there were checks-and-balances that downplayed the tensions called reconciliation strategies. Reconciliation strategies off-set the conflict. This chapter discussed four reconciliation strategies. Each strategy was dependent on the other strategies for full effectiveness. Therefore, the strategies could be likened to constructing a building with the foundation being soft skills.

Soft skills are a combination of interpersonal communication skills for relationship development and maintenance (DeVito, 2015). The specific soft skills mentioned identified in the research data as important were active listening, asking questions, using open and honest communication patterns that encourage organisational members to build relationships. Furthermore, there were processes in place to help when additional clarification was needed when the development process became confusing or too complex for a stakeholder to understand. These strategies were called web development literacy and translation. Translation and literacy provided shared meanings among the development teams, their business associates, and their clients. These strategies were sensemaking and sensegiving strategies.

Sensemaking provided a unique intersection between the data and the ways in which translation and literacy helped resolve organisational tensions. Once soft skills have been learnt and applied, communicating through the chaos of the experience took away the emotional edge common to an entangled tension experience (Sheep et al., 2016). Easing the tensions could also be done by sensegiving. Sensegiving was the process of providing meaning to individuals who had no previous definition understanding of a problem or process, and it is a one-way approach. In contrast, sensemaking is a co-constructed approach. Individuals possessing a sensitivity to these multifaceted approaches, and their cause-and-effect relationships, were identified as having organisational proprioception.

Organisational proprioception comprises a keen awareness of the organisation and how the organisational systems worked together for the benefit of organisational objectives. This chapter introduced and highlighted the importance of organisational proprioception. These processes stabilised the chaos that resulted from the entangled tensions by responding with layered and nuanced solutions. The nuanced and layered tensions and solutions in this research have interesting ramifications for SMEs, CCO, and sociomateriality. The next chapter will discuss the theoretical implications of this research.

Chapter Eight: CCO & Sociomateriality

The purpose of this chapter is to connect the findings from the research with current theories that exist to address the last research question: *What insights does CCO, as a framework, provide for the practitioners?* Therefore, this chapter is an interplay between the findings and the current literature. It must be noted that organisational communication, as a discipline, was in state of considerable flux during the development of this thesis as the concepts of materiality, sociomateriality, and CCO were being intricately developed. Attempting to bind this thesis in time with new theoretical concepts was a difficult challenge. This chapter attempts to address two significant theories that were coming to the fore during this time: CCO and sociomateriality.

The chapter proceeds as follows: a brief definition of CCO is given to remind the reader that this research chiefly aligned with the Montréal School of CCO. CCO is connected to the research, and then this chapter acknowledges the influence of sociomateriality in this work. Sociomateriality is important because of its central place in organisational communication and the assumption that it is part of CCO research (Ashcraft, et al., 2009; Mills and Cooren, 2016; also see *Communication Research and Practice*, vol. 2, no. 3). This chapter begins by reminding the reader of the tenets of CCO.

Connecting CCO

There are three primary schools of CCO: the Luhmannian, the Four Flows, and the Montréal School. Despite the differences among these schools of thought, there are six common premises of the CCO philosophies. First, CCO research investigates communication events. Examining a communication event means accounting for how communication occurs “in and through” (Cooren et al., 2011, p. 1152) the organisation, giving no preference to talk or text. The second premise encourages CCO research to be as inclusive as possible in the definition of organisational communication by acknowledging all forms of communication. Third and fourth, CCO research acknowledges the co-constructed nature of communication while being as “inclusive as possible regarding what or who is taking part in the constitution organisational process” (Cooren et al., 2011, p. 1152); it is in these two premises that we note the importance of sociomateriality. Fifth, CCO scholars are required to stay within the realm of the communication event,

meaning the research is grounded in the action of the communicative process and flow. Sixth, and finally, “CCO scholarship favors neither organizing nor organisation” (Cooren et al., 2011, p. 1154).

Brummans et al. (2014) wrote of CCO as a symbolic progression from talk to text to action. The process of converting talk into text is an act of translation. It is a symbolic alteration from sound-symbols to written-symbols. Then, text to action requires another behavioural translation. To summarise, the CCO process explains how communication events constitute organisations. From a CCO lens, communicatively constituting an organisation occurs through knowledge management (text), through using metaphors and soft skill (talk), and through sensemaking (action). To provide an illustrative example, I use a quote from Justin [consultant/project manager, #14]. He said, “The translation process is needed for the communication gaps.” CCO, as written by the Montréal School, provided the theoretical framework for the process to which Justin was referring. High-tech translation is a process of taking complex computer codes, or processes, and transforming the process into a meaningful experience through sensemaking and sensegiving strategies.

Examples of CCO and translation. Justin’s reference to communication gaps are a synonym of entangled tensions. Communication gaps and entangled organisational tensions represent communicative conflicts in an organisation. Entangled tensions explore the pushes and pulls of a variety of issues which occur simultaneously on the firms’ resources—human or nonhuman. Communication gaps are a metaphor that represent organisational tensions and organisational members’ perspectives as a divide. Notably, 7 of the 32 participants described the communication conflicts they experienced as communication gaps.

The research data was replete with examples of different stakeholders that were interested in the same outcome, but seemed to lack the language to negotiate the situation. Layla described an example of communication gaps or entangled tensions; this example was previously used, but it is a prime example of the gap metaphor. In her mid-sized firm, they struggled to get the email to work, and their developers were struggling to get the managers to understand why the email would not work. The management was unclear about how the server worked and how the problem affected the email. In short, both parties were interested in the same outcome, but they did not have the language to negotiate the situation. This is an example in CCO of the talk phase of the process because the two groups were

having difficulty finding shared meaning in the language they were using. This phase also requires sensemaking because the IT department and management were in a state of chaos and were having difficulty coordinating meaning.

The developers wrongly assumed that management understood that email and server problems were interconnected. Even though both groups were focused on the same problem, neither had the language, nor the understanding to bridge the communication gap they were experiencing. This experience was resolved by educating both groups. The developers needed to be educated on how to explain complex IT challenges to management. In turn, management needed web development literacy; they needed to understand the intricates of the web development process. Eventually, the concerns of the respective stakeholders were translated into words and ideas the other group could understand. This was done through email and requiring the IT personnel to take communication classes. This is an example of the CCO process flowing from talk to text to action. The behavioural piece was the resolution of the problem. The management and IT teams acted differently once they had *made sense* of the problem.

The experiences described by the participants of entangled tensions were also filled with emotions reiterating the significance of sensemaking during the tension reconciliation process (Weick, 1969, 1995). Sheep et al. (2016) noted that emotional conflict in the firms heighten organisational tensions. Here, I am arguing that emotional *urgency* heightens organisational tensions, and it also heightens the need for reconciliation strategies for the conflicts that resulted from entangled tensions. In Layla's experience, she described the anxiety and frustration present within the teams' during the email fiasco. This example reinforced the need for sensemaking based translation.

Another example of CCO from talk to text was provided by Max. Max [software technical writer, #26] recounted the difficulty of translating the web development process for the client. He explained:

We have to interview developers and then take what they say and translate it into English; so that, people can understand what it does [lines 48-49].

Note Max's comparison of his job to a foreign language translator. For him, the developers' languages were the equivalent of a foreign language which could be completely misunderstood by the clients unless the clients had some knowledge about web development.

Managing development teams provided communication challenges that required a specialised translation process. Computer programming languages are diverse and the *speakers* of those languages need to have their own set of communication skills. Paige [HR representative specialising in high-tech, #27] had an experience early in her career when she hired a *UX/UI developer* (user interface developer), but the development team needed a *back-end developer*. Back-end developers code much of what the user does not see, such as how the website is connected to the servers, networks, or other important system functions for the website to work correctly. Paige was assuming any developer would be able to *speak* or *translate* any high-tech programming language. When Paige [HR representative specialising in high-tech, #27] hired the UX/UI developer, she never expected to get this response from the firm owner: “Look at their resume; that candidate has more emphasis on UX/UI when I need them to be a hardcore developer.” Just as a common language needed to be developed among the business and development teams, a common language also needed to be developed among the developers and their specific expertise.

Kevin [project manager/consultant, #14] used an example from his childhood to explain this phenomenon.

It’s like my mom used to say—I am Chinese-American—she would say this to me when I was a kid. It’s like a duck talking to a chicken. They both have feathers and are both birds, but they speak completely different languages [lines 82-84].

Kevin’s metaphor highlighted the idea that what might appear to be similar is not. Development teams struggle with similar problems. They are both working on code, but they have different set of expertise. To further the metaphor, if a co-worker or client did not understand the development process, they may incorrectly assume the developers can answer or fix any-and-all IT questions or problems.

This particular communication challenge demonstrated two important points. One, it is emblematic of the complexity of entangled tensions and the dangers of making assumptions in the firms because high-tech specialists do not always understand one another as easily as one might expect. Two, it illustrated that when reconciling the tensions, a multi-faceted approach must be taken. While dialectical tensions pull in two opposing directions, translating within a development team, with business teams, and with the clients is indicative of how organisations need metaphors, sensemaking, and organisational literacy to improve and work together to accomplish the organisational objectives (Kuhn &

Schoeneborn, 2015; Maitlis & Christianson, 2013; Sheep et al., 2016; Weick et al., 2005). Further, the communication gaps among developers and their highly technical knowledge reflected the value of the translation process and the importance of web development literacy. Using these process as an example, it demonstrates that, in essence, translation and the theoretical enactments of CCO are parallel.

The principles to reconcile conflict was best summarised by Jameson [project manager, #29, line 41] who said, “Once you understand that the gap exists, there is a lot of different factors and options to solve the problem.” William [project manager, #9, lines 206-207] shared a similar observation when he said, “It’s just basically, there is never going to be a holy grail, I think it’s just it varies by organisation and especially by teams.” The data demonstrated numerous ways in which translation and literacy processes supported the organisation by helping the firm members and clients make sense of their experiences. These sensemaking experiences were aided and complicated by the technology with which they worked. As a result, the research participants had to make sense of technology and their communications flow; this is sociomateriality.

Considering Sociomateriality

Sociomateriality is the intersection of technology and humans interacting with the intent to accomplish organisational objectives (Jarzabkowski & Pinch, 2013; Leonardi, 2013; Orlikowski, 2007, 2010). Sociomateriality needs both human actors and hardware (the material components of the technology) to exist (Leonardi, 2013). *Socio-* suggests a relational and social component to the material. It is the sociality of sociomateriality that soft skills become valuable. In other words, the relationships maintained through and with the material (technology) also require some soft skills proficiency. Orlikowski (2007) defined sociomateriality as the “recursive intertwining of humans and technology in practice” (p. 1437). Their inseparability is context specific. However, the participants in this research saw themselves as connected to the technology, but not intertwined with it. They valued face-to-face interaction more than technological interactions. This aligns with Leonardi’s (2011) argument that the technology and the participants are *imbricated or entities layered on top of each other*.

To further the connection between the tech hardware and relationships, sociomateriality may be argued as a relation of the material to the symbolism of language and relationships (Ashcraft, Kuhn, & Cooren, 2009), and thereby an

extension of the soft skills needed for organisational success. An example of sociomateriality and soft skills are a developer asking a clarifying question about a project by instant messaging the project manager or business analyst. There are two layers of sociomateriality in this example. First, the developer is using the material, his or her computer, to *build* a website for the firm's client. Building a website for the client has several symbolic meanings: it is part of the firm's organisational identity; it creates a place for the client to interface with their own customers; and, it acts as a public relations tool for both the client and the web development firm. Second, when the developer asked his/her question through a computer mediated channel, instant messaging, he/she created a relationship with their co-worker that was dependent on the technology. Thus, instant messaging emphasises the sociomateriality of the organisational relationship. This is an example of the material being used to build a working relationship to meet organisational goals.

As demonstrated in the example above, soft skills were needed to connect the organisational members which allow them to cooperatively meet organisational goals and that often happens through computer-mediated channels. In the case of web development firms, communication happens *because the website is a computer mediated communication channel*. Therefore, soft skills complement hard skills by making the website a union of both skill sets. The *combination of hard and soft skills* is necessary for these firms to complete their organisational goals. While the hard skills are often the skills that allow the organisational members to successfully interface with the technology, the soft skills allow the organisational members to communicate using the material. For example, the project manager needs to interface with the hardware to create project completion goals (Schwalbe, 2013) and the project manager needs to be able to communicate those goals with the stakeholders.

We can also consider another perspective on participants' comments that connect soft skills and sociomateriality. To begin, relationships are important. In order to build a relationship with someone in the firm, the person must have some high-tech knowledge or an expert-layman connection since most interactions would be technology-mediated experiences (Martine, Cooren, Bénel, & Zacklad, 2016). Next, the technologically-dependent nature of relationship building in firms was taken for granted (Simpson, Cunha, & Clegg, 2015); it was an assumption of life in the web development firm. Finally, online communication experiences did not and could not be a substitute for face-to-face communication (Turkle, 2012). These

principles also extended to the relationships the firm built with their clients. Note these points in the quotes:

I have them (the developers) spend time with [their development guru's, and they] knows their face and [the guru] has a little more empathy for them [Demetri, project manager, #17, lines 146-151].

It depends, the one thing that I've noticed in the computer world is that people are more likely to keep their computer guy if they know them and they're friends with them. So that relationship is really important [Laura, small firm owner, #22, line 123-125].

As Demetri emphasised, knowing a co-worker or client's *face* is meaningful. This was particularly notable because their work environments were primarily online and in front of computer screens. Jeff [small firm owner, #18] had a large portion of his employees telecommute, but admitted that this placed a strain on the firm.

However, for him, the benefits of telecommuting-employees outweighed the risks for the organisation. It was an entirely different matter, however, when it came to client relationships. Jeff was adamant that the clients interacted face-to-face with firm members once a month or at least quarterly.

I think making sure there is regular communication. It doesn't necessarily all need to be face-to-face, but I would, my recommendation would be that a percentage of it is face-to-face, maybe once a month, maybe once a quarter. When you are in front of your clients letting them know what is going on and letting them know what your plans are for the future to deal with their project [lines 152156].

Again, the purpose of the relationships was to *make sense* of the technological complexities of web development. Similarly, sociomateriality accounted for the complexities by bridging the combined human and material experience gap. This suggested that soft skills and hard skills present on a continuum. The soft skills-hard skills continuum further demonstrated the layered approach to sociomateriality when it was viewed from a CCO perspective.

Sociomateriality and CCO. Sociomateriality mirrors the principles of CCO. Like CCO, sociomateriality was a layered experience of the human-technology interface and was often taken for granted because of its ubiquitous existence (Leonardi, 2013; Taylor, 2011), just as communication in an organisational setting was taken for granted. Like sociomateriality, CCO accounted for human and non-human actors (Cooren et al., 2011) with communication skills inherent in the framework of both sociomateriality and CCO. Given these similarities, CCO and sociomateriality provided a mutually supportive theoretical

approach with an emphasis on the technological presence in organisational life. Therefore, the data presented in this section, and throughout this chapter, affirm that sociomateriality is a needed theoretical connection between web development and CCO. Also, Kuhn (2016) argued CCO is a narrative experience. When the participants spoke of soft skills failing, it was often in the form of a story, like Jeremy's experience of losing a client over a series of misunderstandings. The narrative experience of CCO *underscored* the existence of soft skills while sociomateriality *highlighted* the need for soft skills. Combining these two approaches introduces an overarching approach to account for organisations which are bounded by their technology. Sociomateriality, in effect, explained the essence of a web development SME, and that purpose was enhanced by organisational members' soft skills.

Conclusion

The purpose of this chapter was to connect the research to CCO and sociomateriality which responds to the research question: *What insights does CCO, as a framework, provide for the theory development of these organisations?* Combining this research with CCO and sociomateriality answered theoretical questions, such as, *what does communicative constitution look like?* (Bisel, 2010). From this data, it is evident that organisations are communicatively constituted in their daily communication patterns. Furthermore, the data also explained why relational approaches to organisational communication are enmeshed with CCO and are not separate approaches to organisational communication research (Brummans, Cooren, Robichaud, & Taylor, 2014; Deetz & Eger, 2014). Finally, this chapter also suggested that a whole organisational system must be considered when evaluating organisational tensions, their subsequent conflicts, and their resolutions. This research provided an explicit bridge among the presented data, sociomateriality, and CCO by arguing their similarities and noting the interconnection of CCO and sociomateriality with high-tech firms.

Chapter Nine: Conclusion

This chapter concludes my investigation into web development firms that began with the research problems presented at the beginning of the thesis. I was intrigued by the CCO philosophy, but I noticed a lack of connection between the theory and its application to a whole organisation or industry. When I started this research in 2014, CCO had not been applied in research investigations which considered organisations as whole systems. As a result, I set out to understand how and if CCO could be applied to the communication problems of web development firms. I chose web development SMEs for three reasons. One, I had a personal interest in their viability. Two, these particular firms seemed replete with communication issues. And three, the study of high-tech SMEs was missing in the organisational communication discipline. In order to be able to work from the bottom up to answer my research questions, I used grounded theory. I wanted to see where the data would take me (Glaser & Strauss, 1967; Corbin & Strauss, 2014) and if I would be able to apply the data to the tenets of CCO.

This chapter will review the significant points from this thesis. To begin, I review the background of this research as well as the contextual findings. Then, I address the benefits of organisational tensions as related to CCO and the implications this research provides for practitioners. I recap how the data addressed the research questions presented in the methodology chapter. Next, I present the contributions this research made to organisational communication. The chapter will end with a noting of the research limitations and then opportunities for future research.

Background and Contextual Findings Review

The importance of this thesis investigation is best understood from the lens of the scope of this research and the contextual findings. The research focused on SMEs in the ICT sector. The OECD (2005) defined small firms as those with 50 employees or less. Medium firms comprise 50 to 249 employees, and large firms are 249 employees or larger. Hence, small and medium-sized firms may have more than 10 employees but less than 249 employees. Firms with 10 or fewer employees are microenterprises. This is important because the range of participants interviewed came from microenterprises to medium-sized firms. The firms were located in Silicon Slopes.

Silicon Slopes is a region located on the Wasatch Front in Utah, USA. It was chosen because it met the criteria for a tech hot-spot (OECD, 2015). Tech hot-spots are locations designed to support innovation. The criteria for a tech hot-spot are: the local or regional economy supports high-tech firms; the purpose of the local or regional high-tech industry is to maintain already existing high-tech products; these hotspots develop new technologies; and, local social resources are available to nurture innovation such as educational institutions (OECD, 2015). ICT in Utah and the unique opportunities presented by the cultural environment through local governmental policies, such as the technology commercialisation and innovation programme (TCIP) and the Utah Technology Council (UTC), provided a nurturing environment for ICT companies. It was noted there are adequate financing options for small high-tech firms which contrasted to the other areas where small high-tech firms are known to struggle (OECD, 2015b). The educational institutions that support high-tech firms are Brigham Young University and the University of Utah. Silicon Slopes met all of the hot-spot requirements with additional support from the LDS church and their cultural emphasis on self-sufficiency and technological advancement (Muro et al., 2015; Vara, 2015).

The contextual findings proved insightful for the rest of the findings and elucidated areas important for the thesis. In the contextual findings, the web development communication patterns in the firms were described. This flow began with the firm competing for clients through the bid process. Once the clients were contractually connected to the firm, the firms provided a single-point of communication for the client. This contact was an individual who was perceived as being proficient in soft skills and was often the project manager. From this point, the communication proceeded as a back-and-forth among the clients, developers, designers, and project managers or small firm owners. Understanding this process provided a foundation into the areas where communication gaps occurred.

Communication gaps were holes in the flow of communication. These holes were a result of failures to fully understand the web development process. As a result, conflicts would occur when the individuals involved in the project encountered misunderstanding that resulted from a lack of shared meanings or shared language. Although it was the role of the project managers to eliminate as many communication gaps as possible, they still occurred. However, the gaps and the resulting conflicts proved beneficial for the firms.

Benefits of Organisational Tensions as Practitioner Implications

As CCO scholars noted, tensions and conflict resolutions are the communicative acts that keep organisations moving forward (Kuhn & Schoeneborn, 2015). Therefore, organisations can strategically benefit from tensions and conflicts (Baker & Lu, 2015), and there are also implications for the practitioners. Easing the tensions through soft skills was also connected to CCO (Kuhn & Schoeneborn, 2015; Vásquez, Bencherki, Cooren, & Sergi, 2017). CCO theorists acknowledged the connection among tensions and suggest it is implied in the theory. However, this research explicitly argued that tensions must be made explicit because the firms demonstrated how *conflict resolution was their primary motive for their communicative practices*. As conflict resolution tools, soft skills such like listening, asking questions, organisational sensitivity, and building relationships resolved tensions and maintained the firms. As a result, I argue that soft skills are not just important from a human resource perspective, but they are critical for organisational success and they constitute organisations as they are practiced. These foundational communication skills are the *glue that holds* the organisations together.

There are several strategies listed here that are applicable to the firms. To begin, understanding tensions as an inevitable part of innovation and organisational life created a shift in perceptions and the strategies employed to deal with the tensions. Another helpful approach was educating firm members in web development literacy to identify the organisational systems and to increase their organisational proprioception to such an extent that reactive communication patterns were minimised. Finally, combining the unique areas of expertise in the firm, such as understanding the web development process and the sales process, enhanced problem solving in the firm.

Understanding that tensions are part of innovation was a time-based lesson for some of the participants involved in this research. Veteran project managers understood that tensions were an ever-present reality; this was less obvious to younger owners or project managers. Therefore, exposing small business owners and entrepreneurs to the reality of organisational tensions could ease their learning curve. This could be accomplished through existing partnerships that support small firm growth. For example, the Silicon Slopes organisation could have dedicated mentors to educate young firms on the intricacies of tension mitigation, or small business administration groups could offer workshops.

Workshops, or online courses, could include information on soft skills, such as, listening and learning how to ask questions. They could also provide firm members with a basic knowledge of the development process. Internalising the development process would increase organisational proprioception. Furthermore, it would provide resources for the firm to create a shared language. Understanding would assist in defusing the inevitable tensions around ambidexterity, project management constraints, and unrealistic expectations. Moreover, a basic education on the development process could also demystify stereotypes. Proactively working to demystify stereotypes and creating a shared language could increase productivity.

While tensions are part of the high-tech firm reality, reactive strategies could be mitigated. This may be accomplished by increasing soft skills and using available resources, like project management literature or podcasts. Applying soft skills and translation strategies could decrease the frequency of crisis mode. I argue that web development SMEs need to gain some education about metacommunication. Furthermore, small business owners could benefit from having project management education. The project management literature provides a plethora of resources for tension mitigation. In summary, understanding that tensions exist and that soft skills are necessary tools to mitigate the effects of the tensions could profoundly impact practitioners and the success of web development firms by providing alternatives to communication avoidance.

Addressing the Research Questions

The primary focus of this research was to investigate the question, *what are the major communication challenges and issues in small and medium web development firms?* During the initial literature review, I anticipated that the major communication challenges would align with previous SME high-tech research. There were some communication challenges which did align, such as the pressure placed on web development SME's resource management (Núnes, et al., 2011). However, there were several unforeseen communication challenges or contextual findings identified. Among those were the importance of a community support for innovation and high-tech SMEs. From previous research I suspected organisational tensions would be present. However, I did not anticipate the complexity these tensions involved. The primary challenge that affected the communication in the firms were trust and stereotyping. Again, neither of these topics had been anticipated in the early days of the research project. Another major communication challenge was the intense influence of ambidexterity on the

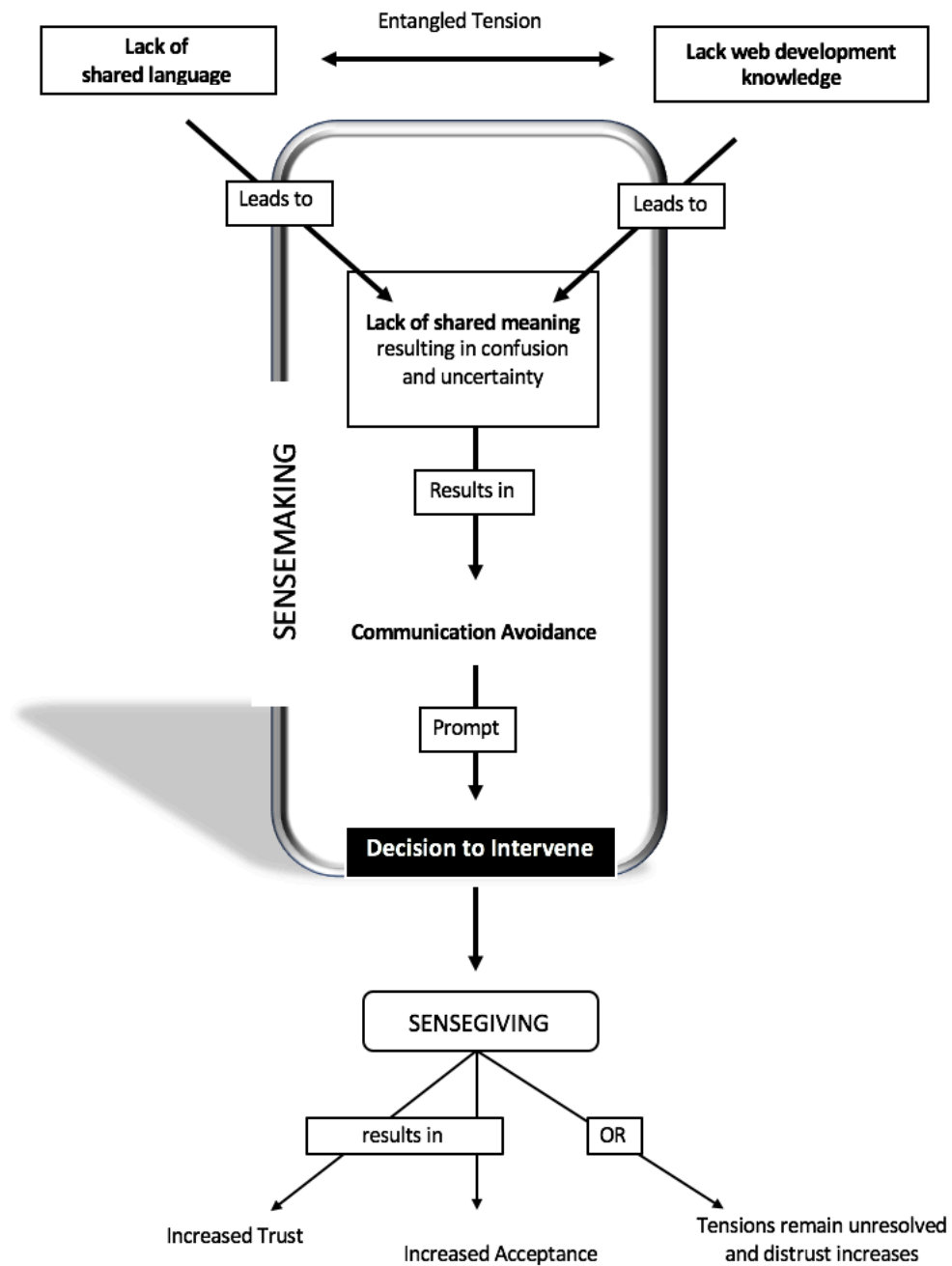
communication patterns in the firms. As managers worked to navigate the ambidexterity in their firms, part of the aftermath was organisational tensions. Of all the communication challenges, the most consistent challenges were the communication gaps and their influence on the already-present tensions caused. Furthermore, organisational communication tensions presented as entangled and messy conflict that simultaneously pulled against many organisational members and issues. These presented differently than expected. Consistent with GTM, there were challenges that arose that were completely unexpected that are extensions of CCO and organisational tensions research.

As the data was coded, analysed, and compared, the primary communication challenges in the web development firms emerged as entangled tensions. Dialectical tensions were anticipated, given the research previously conducted in organisational and relational research and because the human experience is replete with dialectical pulls (Bakhtin, 1981; Baxter & Montgomery, 1996). Since organisations comprise humans and nonhumans, it could be inferred that dialectical tensions would be present. However, what was not anticipated was the complexity of the tensions and the ways in which multiple dialectical tensions would pull against each other in the firms. Nor, did I foresee the imbricated nature of the tensions in web development SMEs

Kuhn and Schoeneborn (2015) alluded to tensions as integral to CCO when they stated that organisations move forward through tensions. However, they did not explore nor expound on the energy produced through tension reconciliation. The entangled tension findings in this thesis were supported by recent findings in technology organisational research such as the work of Sheep, Fairhurst, and Khazanchi (2016), where they noted that the combination of technology and people lead to more complex tensions than the push and pull of the dialectic grammar. Furthermore, they argued that technology inherently enhanced and complicated those tensions. This led me to deduce that an enmeshed-typed tension better explained the organisational tension experience in web development SMEs (Hardy & Thomas, 2015; Orlikowski & Scott, 2015). To summarise, the major communication challenges experienced by web development firms were entangled tensions that resulted from a lack of shared knowledge and a lack of shared meaning or language.

Figure 18, below, demonstrates the communication challenges for web development firms that this research has identified.

Figure 19. Communication Challenges of Web Development Firms



In Figure 18 the flow of the entangled tensions and their reconciliation is illustrated. Furthermore, we can see how a lack of shared language and a lack of web development knowledge are enmeshed tensions that lead to confusion and uncertainty among the firm members - because of the lack of shared language. Since there is a lack of shared language, the tensions lead to communication avoidance wherein organisational members avoid the conflict by focusing on the tasks required of them. To reconcile the tensions, organisational members engaged

in sensemaking and sensegiving strategies. Sensemaking existed in a co-constructive process during the chaos when there was no shared meanings and during communication avoidance phases. However, there was a point when project managers and small firm owners decided to intervene by providing meaning for their firm members through sensegiving and web development literacy strategies. Meanwhile, organisational members made sense of their own experiences with the entangled tensions and the communication avoidance by sensemaking strategies such as metaphors or other translation exercises to clarify the uncertainty and confusion the firm members experienced. When sensegiving and sensemaking were proactively used by the firm, it increased the trust and acceptance among firm members. However, when these strategies were not used proactively, the tensions remain unresolved affecting morale and organisational proficiency.

While these tensions were not new to ICT industry research, what was new was the clear evidence that there are specific communication strategies that may be employed to reconcile the conflicts that are the tensions. These strategies hinged on soft skills such as listening, asking questions, building relationships, and organisational proprioception. These strategies required a communicative approach that was not included in the current literature about web development SMEs. Whether the firm leadership engaged the specific strategies from this research, or comes up with their own strategies, was a dependent on the choices of the project manager or small firm owner. Firms needed to move from reactive to proactive communication practices. While tensions will always exist, communication tensions were minimised through proactively engaging in soft skills, learning, and translation practices.

The communication challenges in the firms were the result of tensions caused by a lack of shared language. Since GTM encouraged narrowing the research questions as the research progresses (Corbin & Strauss, 2014), the first supporting research question was, *during what transitional moments in these organisations does communication practices become a priority?* While organisational members generally considered communication with angst, paradoxically, it was perceived as a benign experience. In other words, no one wanted to talk about communication because it took away from productivity, but it was simultaneously necessary. Communication was difficult for the participants to define. As a result, it was difficult for them to explain when communication became a priority. However, anytime organisational or relational tensions were out of

balance in the web development firms, communication became a priority; it was especially evident that communication became a priority when the participants used crisis management metaphors, like a *fire* or a *bug*. The statement from William [project manager, #9, lines 192 -193], drawn on earlier in this thesis, is worth repeating here: “Whenever we do a review [of a project], every single time the number one issue that comes up is communication.” These communication issues were discovered when the practitioners’ experiences were shared during the interviews. To explain when communication was a concern, the participants would share stories as examples of their experiences. This is significant for a few reasons. The narratives were about tension and tension resolution strategies. Also, their stories were sensemaking experiences through which they organised their chaotic organisational challenges into an easier-to-understand experience.

Among participants’ sensemaking strategies were speaking with metaphors. The relationship between metaphors, sensemaking, and communication is one of co-constructing meaning. Metaphors were used to clarify an unclear concept by relating it to a concept or idea with which a person was already familiar, thereby, creating a similar meaning for events or words. In the same way, sensemaking was the process of taking an uncertain situation and creating a shared meaning, and was continually occurring as meanings were constantly redefined. In essence, this was the process of co-constructing meaning, an essential communication practice. This study elucidated evidence of patterns where web development SMEs and their organisational members did this for each other and for their clients. For example, the interviewees would use metaphors to explain concepts to me as they would to their clients. Otherwise, organisational members attempted to avoid communication until another conflict arose. If the firm was in a state of certainty, the organisational members did not perceive themselves as communicating or needing to communicate. This aligned with the sensemaking literature where Weick (2001) explained that sensemaking occurred when chaos ensues. As mentioned, it was only when chaos existed that the firm moved into a proactive communication mode.

Since there was no existing literature about the communicative practices of web development SMEs, the second supporting research question asked, *what are the underlying assumptions about communication? What challenges do these underlying assumptions cause?* The underlying assumptions about communication depended on the participant. If the participant was a project manager, the underlying assumption was that communication was part of the project

management process. If the participants were small firm owners or developers, communication was seen as a formal communication event, like a meeting. Another assumption that existed about communication was that it took too much time. The perception among the participants was that communicating meant they would get behind on their work. Ironically, however, communication was necessary to accomplish the required tasks.

The entangled tension of communication answered the third supporting research question: *what strategies are being used to solve the communication challenges which do occur?* Since communication challenges emerged as entangled tensions, the communication strategies used to reconcile the conflicts were also layered approaches of soft skills, web development literacy, and translation. Soft skills were the interpersonal skills the firm required of its employees for positive workplace interaction with each other and with the clients. Web development literacy was a process used by the firms to educate their clients and co-workers about the web development process and presented similarly to sensegiving (Gioia & Chittipeddi, 1991). Translation was a form of reorganising technical information about the development process into metaphors or language common to the average computer user. In other words, it was the process of making sense of the development process. Each firm used all three processes.

How the firm executed these processes depended on management and organisational culture. The strategies mentioned above were also dependent on the organisational proprioception of the participant. Organisational proprioception was introduced in this research and was defined as an individual's sensitivity to how the system worked. For example, if the interviewing participant had previously worked as a developer, they were more likely to be patient with the development process and developers. Therefore, they approached the entire project differently by anticipating tensions and working to resolve these through soft skills through empathy with the developers and the technological constraints. They were proactive in the management of the mounting tensions instead of waiting until they escalated into a crisis. The communication strategies of soft skills, learning, and translation were also components of CCO.

The fourth research question was: *what insights does CCO, as a framework, provide for practitioners?* Answering this question required the combination of GTM and CCO. The GTM approach provided sufficient flexibility to explore the data from the ground-up (Charmaz, 2014) while comparing the data to other

existing theoretical premises (Suddaby, 2006; Urquhart, Lehmann, & Myers, 2010). The CCO framework informed the study by accounting for organisations/organising as a process of communication that became an assumption of the operational outcomes of the research. The data demonstrated that even though the participants preferred to avoid communication, they also knew their organisational success was contingent on it.

If the participants did not communicate with each other and the client, the organisation would not exist because they would not have clients to service. Consequently, *web development SMEs were constituted through communication*. CCO encouraged all communication forms to be accounted. This is important since materiality and sociomateriality are an assumed part of the constitution of communication (Aakhus & Laureij, 2012; Cooren, 2006; Cooren et al., 2011; Leonardi, 2012). CCO also supported the inclusion of language barriers as an organisational challenge; in this case, the language barrier was highly technical development language(s) instead of the spoken languages as evaluated in other CCO research (Constantinides, 2013; Cooren & Sandler, 2014; Kopaneva & Sias, 2015).

The challenge with using CCO in this research project was the lack of theoretical writings about organisational tensions and conflict in the CCO literature. While it was assumed in CCO that tensions moved the organisation forward (Kuhn & Schoeneborn, 2015), there is no explicit discussion of tensions. An example from this research of how tensions moved the organisation forward was the bid process. The process of gaining a client through bidding was riddled with negotiation and tensions resolution. The firms could not gain clients without tensions and tension resolution. Taylor (2011) suggested that tensions were imbricated into communication, or issues and challenges are layered on top of one another (Sheep et al., 2016). In other words, Taylor (2011) was arguing that tensions were implied in the communication experience. However, such a CCO view of tensions did not apply in this research.

In this research, I referred to the tensions as entangled tensions to give a name to the implied tensions that are referred to in CCO theorising and literature (Taylor, 2011; Barad, 2003; Orlikowski & Scott, 2008a). All the tensions identified in the research materialised as enmeshed communication challenges that became evident when the data was deconstructed. The deconstruction process revealed that the tensions are pulled in several directions simultaneously. Within

the imbricated tensions were layers of dialectical tensions. Stereotypes, for example, were multifaceted, enmeshed with trust, and reflected the dialectical tension of us versus them. Understanding these tensions furthered CCO research by making tensions explicit in the theory.

In summary, there are communication challenges in web development SMEs that centre on interpersonal communication tensions that occur among clients, employees, and other stakeholders. For the most part, none of these stakeholders wanted to communicate with each other, but when a crisis or misunderstanding occurred, they were required to stop avoiding and start addressing one another. Part of the reason they did not want to communicate was because of the underlying assumption that communication takes too much time and too much effort to ensure that their meanings were clearly conveyed to other colleagues or clients. However, when they did proactively communicate, they used a myriad of interpersonal communication skills to solve their problems. The industry called these soft skills. They also used a process I have termed translation that involved converting the highly technical processes and computer languages of their work into information and metaphors that their clients or co-workers would understand. Because of their limited understanding of communication, CCO did not provide any insights for small firm owners. However, the project managers and human resource individuals interviewed consistently commented that communication played a central role in the firms and that their projects could not be completed unless communication was discussed and refined.

Contributions

Of the various contributions this study made to the current organisational communication discipline, three of the findings had the most significant potential for impact. This study required that organisational tensions are an explicit part of the CCO. Making organisational tensions explicit, with all their complexities, provided a link between the theoretical research and the applied research scholars were seeking (Boivin, Brummans, & Barker, 2017). Since one of challenges of CCO was bridging the gap between the theoretical and the functional, emphasising methodologies that examined the tensions would assist in enhancing the research. When emphasising organisational tensions and using tension analysis as a methodology, the researchers could extract the undercurrents of the communication flow that are holding the organisation together.

The next significant contribution of this research was entangled tensions.

Tensions in organisational communication are often presented in a dialectical format, in that, one pole pulls against another pole. An example from this research is us vs. them. However, dialectical tensions did not represent the full complexity of the experience. The tensions were dialectic (Putnam, 2015), enmeshed (Orlikowski & Scott, 2015), *and* knotted (Sheep, et al., 2016). Knotted tensions are organisational tensions specifically present in high-tech start-ups. My research combined these categories of tensions by introducing entangled tensions. As a concept, entangled tensions acknowledges that practitioners have creative ways of reconciling the conflict they cause. Furthermore, I argue that organisational communication scholars need to explore entangled tensions to further understand the experience of the practitioners and their sensible management strategies. Understanding the combination of tensions and reconciliation strategies has the potential for scalability to help improve other firms in other industries.

Among the reconciliation strategies, the most significant contribution was organisational proprioception. Organisational proprioception was defined as a sensitivity to the organisational systems. In other words, it is being cognisant of the organisational processes and the cause and effect of communication practices within the organisation. This may seem like an obvious skill set but it is not. This is important particularly because the definition of communication was confusing and inconsistent among the participants. Organisational proprioception was not organisational culture. Instead, organisational proprioception was a sensitivity to the organisational system and how the subsystems interconnect. It was a nuanced sensitivity to the organisational system, not the system itself and reflected the interest the organisational members had for organisational success. In other words, proprioception occurred when individuals working in the firm have *bought-into* the firm's vision and objectives.

It has been found that entrepreneurs and managers who are unaware of the necessity of communication strategies can cause organisational developmental problems (Heavin & Adam, 2012). An individual attuned to the effects of the communication flow in the firm and the ways in which it influenced the entire organisation has a unique skill. In many ways, these individuals were the prime sensegivers for the organisation, and they would make proficient managers. The significance of this finding is that this is a skill that could be taught. This means that a firm that understood organisational proprioception would be able to make sense of

the uncertainty and chaos more quickly than those who think communication is only a meeting. It also meant these individuals could foster greater connections among individuals in the firms, thereby decreasing stereotypes and increasing trust.

This research has contributed to the growing body of literature combining CCO with information systems (Aakhus et al., 2011; Constantinides, 2013; Martine, Cooren, Bénel, & Zacklad, 2016). It also contributed to research on organisational tensions and high-tech firms (Hardy & Thomas, 2015; Orlikowski & Scott, 2015; Putnam, 2015; Sheep et al., 2016), to literature on soft skills (Hurrell, 2016; Riggio & Saggi, 2015; Sultana, 2014) and the nuanced communication challenges of web development SMEs. Understanding nuanced communication challenges provided insights and better communication strategies for internal organisational communication in the firms (Büschgens, Bausch, & Balkin, 2013).

The existing literature on these firms primarily came from the strategic management discipline, not the communication discipline. In Taylor and van Every's (2014) case study on software implementation in the New Zealand police force, they noted trust was an important communication component. The primary issue during the implementation of the police software system was the trust or distrust of authority. The contribution of this research to Taylor and van Every's (2014) findings were significant in that it identified the combination of trust and authority as unified, yet distinct experiences (Priem & Nystrom, 2014). For example, the developers trusted individuals who respected their high-tech skill sets. When adequate time and resources were provided to complete the tasks required of the developers, they extended their trust. In contrast, if trust was weak among the developers and management, problems occurred. The developers engaged in small acts of rebellion to thwart the project. Management would start to micromanage the developers. In these scenarios, it is a lack of trust that reinforced the need for trust in the firms.

The overlapping features of entangled tensions was a component of the research that combined information systems and CCO (Constantinides, 2013). This portion of the research contributed to CCO by explicitly stating the importance of tensions in organisational communication and its relation to this theory. Not only did it make tensions in CCO unambiguous, it further combines Taylor, van Every, and Cooren's work to indicate that tensions were layered, and could not be viewed from a dialectical lens only (Cooren, 2006; Taylor, 2011; Taylor & van Every, 2000,

2011).

Communicatively constituting an organisation required soft skills. One of the contributions of this research was introducing soft skills to the organisational communication discipline as a tension reconciliation strategy, instead of approaching it as a desirable skill set for human resource representatives (Sultana, 2014). Additionally, combining soft skills with translation and literacy was significant. This research demonstrated that when soft skills were present learning and translation occurred effectively. Translation and learning also contributed to the literature by interweaving the combination of knowledge management and sensemaking into tension reconciliation strategies for the firms. Knowledge management was understanding how and where knowledge exists in the firms (Dalkir, 2011). Combining sensemaking with knowledge management meant a space for making sense of the chaotic management of knowledge in small and medium technology firms. This intersection is an area in which ambidexterity management strategies enabled entangled tensions.

Weick (2001) argued organisations materialise and are perpetuated through communication. However, the literature was silent on the specific communication strategies of web development SMEs. Also missing from the communication literature was how communication strategies in small high-tech firms help or hinder organisational growth and day-to-day interactions. While some research focused on the day-to-day communication challenges of practitioners in this field (Badir et al., 2012; GarcíaMorales, Matías-Reche, & Verdú-Jover, 2011; Kukko, 2013), the research did not comprehensively explore the communication challenges facing these organisations and their practitioners. In summary, this research helped fill the gaps in the literature about small and medium web development firms, the gaps in organisational tensions and CCO, and it demonstrated the importance of sensitivity to the organisational system as a whole.

Limitations and Opportunities Future Research

The limitations of this study began with the recruitment of developers as participants which was symptomatic of the communication challenges that web development firms faced. Getting a larger sample of developers to participate in the research was difficult because of their time constraints. They simply did not think they had time and space in their work schedules to interview. This challenge suggested a future research opportunity to examine communication from a developer perspective. A developer-only perspective could identify and debunk

stereotypes and provide insights to managers as to how to better connect with their developers. Additional research exploring developer stereotypes and the best-practices for working with developers could also have significant implications for the industry.

Another limitation of the research was the underdeveloped tension concepts in CCO. While the concept of entangled tensions was introduced in this project, it could be developed into a theoretical concept detailing the layers of dialectical tensions within entangled tensions. It also may be scaled-up and applied to other high-tech firms. Also, additional entangled tensions research would provide a stronger connection to CCO elucidating the exact ways in which entangled tensions support CCO theory. The implied connections between CCO and entangled tensions was a limitation of this research and presents another research opportunity for the future.

Another limitation was the restricted exploration of sociomateriality. Sociomateriality was as an assumption of this project. Due to its top-down approach, incorporating sociomateriality would not have been recommended by the GTM school of thought (Charmaz, 2014; Corbin & Strauss, 2014; Glaser & Strauss, 1967). However, future research specifically looking at the sociomateriality of software development could provide additional insight into the layers of coding languages, spoken languages, and human interaction in the firms enhancing the translation process introduced in this research.

Finally, a limitation of this study was the shallow presentation of knowledge management, project management, and their connection to CCO. Project management was repeatedly mentioned by the participants. While project management includes communication strategies (Kliem, 2007), project management techniques could have a stronger influence in future research and organisational communication generally. Project management provided specific tactics to deal with the tensions in the firms. These tactics could be applied and scaled-up with applications to small and medium sized high-tech firms. However, knowledge management and project management are comprehensive disciplines, and were not the intent of this research project. The knowledge management and project management connection could lead to more research opportunities. These opportunities would provide an explicit communicative connection to the two disciplines yielding a new research area in organisational communication.

Beyond expounding on the limitations, this project could generate future research opportunities. First, additional research on the translation process in high-tech firms would provide insights into methods firms that would make the development process a smoother experience for stakeholders. One example from this research was the project manager who made a game out of the project. What other creative strategies are being used to manage projects? Second, the same methodology could be applied to the learning processes in the firms. Exactly how are web development or other high-tech firms teaching their new employees about the firm, if at all? Third, additional research on authority, power, and technology would be an appropriate research topic as recommended by Taylor and van Every (2014). Also, including GTM in the discipline would be enlightening and would support the multidirectional research trends in organisational communication (Putnam & Mumby, 2014a).

Using grounded theory methodology to examine web development SMEs, this research identified communication as a highly nuanced and complex concern. These firms sit on the brink of innovation with a dependence on large firms. Their practitioners are desperate to be understood and trusted. Furthermore, it is the sensemaking of entangled tensions and current technological advances that invite them to grow by using tension resolution strategies to manage their communication challenges. It is at this intersection that their true creativity shines.

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Appendix A: Glossary

The glossary below is a list of definitions for the concepts commonly used in this thesis.

A

Abduction	a creative process wherein the researcher considers all possible explanations and hypotheses, then chooses to engage with the most plausible explanation through empirical examination (Charmaz, 2014; Reichertz, 2007, 2010)
Active Listening	the process of receiving and understanding a message and providing feedback in response to the message (DeVito, 2015)
Agile Development	the software development process involving a more flexible, iterative project management approach where the software program is initially developed, and then updated and improved upon as the software program is tested, used, and maintained (Henriksen, 2016)
Ambidexterity	a firm's ability to simultaneously pursue operational efficiency and organisational innovation (Katic & Agarwal, 2018)

B

Business People	this is a stereotype assigned to individuals or departments that fulfil organisational roles such as sales, management, human resources, accounting,
Buzzwords	cutting-edge technical developments that have emerged in day-to-day vernacular

C

Category	higher-level concepts such as themes (Corbin & Strauss, 2014)
Coding	the process of interpreting the raw data (Corbin & Strauss, 2014)
Coding Clusters	groups of open or focused codes that have been combined to create meaning and insight for the next phase of coding

Communication	is the process of initiating, maintaining or severing relationships and any purposeful activity related to these objectives. These activities may be done one-on-one, one-on-many and through technologically mediated devices
Communication Avoidance	avoiding communication because of personal insecurities or constraints
Communicative Constitution of Organisations	is a field of research within organisational communication focusing on how “discursive-material configurations are reproduced and co-produced through ongoing [communicative] interactions” (Brummans, Cooren, Robichaud & Taylor, 2014, p. 173)
Concept	words that stand for interpreted meaning of the data (Corbin & Strauss, 2014)
Constant Comparative Analysis	the process of comparing one case against another during each stage of the analysis process (Charmaz, 2014; Corbin & Strauss, 2014).
Corporate Language-based Communication Avoidance	communication avoidance specifically contained within the organisational communication sphere; known as CLBCA

D

Dialectical Tension	dialectics centre on the dynamic interplay between two interdependent but opposite poles (Putnam, 2015, p. 707)
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E

Entangled Tensions	are conflicts among organisational members in defining the meaning of words, the meaning of the organisation, and the structure of the organisation. Furthermore, the confusion and misunderstandings that lead to organisational conflicts add to organisational tensions that pull simultaneously in multiple directions. They comprise both knotted and dialectical tensions
Exploitation	an organisation’s activities which are characterised by “refinement, implementation, efficiency, [and] production” of an already existing product or service (He & Wong, 2004, p. 481).

Exploration an organisation's activities which are "characterised by research, discovery, experimentation, risk-taking, and innovation" (He & Wong, 2004, p. 481).

Explicit Knowledge Management knowledge extracted from the persons who created it, made independent of those persons, and reused; it may be saved in books, manuals, documents, sound bites, images, video, or other graphic representations (Dalkir, 2013; Mathiassen and Pourkomeylia, 2003).

F

Focused Coding the second level coding process that occurs by using the most significant and frequent open codes to evaluate the rest of the data (Charmaz, 2014; Corbin & Strauss, 2014)

H

High-tech SME are small and medium enterprises in the ICT sector; they function with different constraints and opportunities compared with traditional SMEs; see Chapter Two for more details

High-tech translation occurs when the high-tech language or the development process needs to be re-explained to make sense to an individual illiterate in high-tech language or processes

I

Imbrication the layers of organisational communication events and practices that simultaneously occur and overlap to create patterns in the communication flow; these communication events occur among people and among the technology they use to communicate

Information Communication Technology is an industry which provides services and products for businesses and individuals to enhance their communication needs; known as ICT

K

Knotted Tensions organisational tensions resulting from entanglements of innovation and the accompanying complexities of high-tech start-ups (Sheep et al., 2016)

**Knowledge
Management**

strategies that assist organisations in gathering, organising, and disseminating knowledge in an attempt to improve the financial and time effectiveness of an organisation (Dalkir, 2013)

M

Materiality

the physical; things that have a unique location, shape, volume, and mass (Faulkner & Runde, 2012; Kallinikos, 2012).

Memoing

writing out observations and notes in a diary-type format with the intent to analyse the data

Micro-coding

an open coding strategy that assigns codes to data line-by-line

O

Open Coding

is the *interpretative* process where the data is broken down into concepts; concepts are the words or phrases used by the researcher representing the interpreted meaning

Organisation

for this research, it is defined in two ways: as a noun and as a verb, that is, a group of people working together to achieve a shared goal and the process of communicating to organising

**Organisational
Communication**

a research approach focusing to organisational studies with an emphasis on the interactions among organisational members and the material items which support organisational members' work

**Organisational
Proprioception**

is a sensitivity to organisational systems; being cognisant of the organisational processes and the cause and effect of communication practices within the organisation

**Organisational
Tensions**

are concepts or persons that pull against each other causing conflict within the organisation

**Organisational
Trust**

the belief that two vulnerable parties (individuals, teams, or small department) can engage in a place of cooperation and reliance to achieve organisational goals.

P

**Project
Management**

the management of a project that creates a unique product or service (Schwalbe, 2013)

R

Reconciliation Strategy	are strategies employed by high-tech firms to off-set the conflicts created by organisational tensions
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S

Sensegiving	a one-way process of making sense on behalf of organisational members; it is the process of giving the definition to another person through communicative practices such as stories, texts, mission statements (Gioia & Chittipeddi, 1991)
Sensemaking	is a co-created process of making sense of an organisational situation that is uncertain or chaotic (Weick, 1969)
Shared Language	is when two or more individuals speak, write, or communicate in the same language
Shared Meaning	is a co-constructed process of assigning meaning or value to a symbol, idea, or process
Silicon Slopes	the ICT sector located on the Wasatch Front in Utah, USA, deemed to rival the better-known Silicon Valley
Sociomateriality	the point of intersection where the human and the material, and their respective relationships, interact
Soft Skills	are non-technical skills needed in the workplace; includes listening, competent oral and written communication, and/or giving presentations
SME	a small to medium enterprise that has 10 to 249 employees (OECD, 2005)

T

Tacit Knowledge Management	is the personal knowledge embedded in an individual's experience; it is the intangible knowledge in the workplace (Mathiassen & Pourkomeylian, 2003)
Theoretical Coding	the coding process that follows focused coding; it is the enhancement of the substantive categories, or most significant codes, developed during the focused coding phase (Glaser, 1978)
Theoretical Sampling	

	is accessing additional data through interviewees, observations, memos, texts, field notes, artefacts, or literature (Birks & Mills, 2011; Charmaz, 2006; Glaser, 1992; Glaser & Strauss, 1967)
Theoretical Saturation	is when no new insights emerge or when the data does not reveal any additional depth for the coding categories (Charmaz, 2014; Corbin & Strauss, 2014)
Theoretical Sensitivity	theoretical sensitivity is the way in which grounded theory accounts for the researcher and his/her state of openness or closedness in relation to the data analysis (Bryant & Charmaz, 2011a; Creswell, 2009; Glaser, 1978).
Translation	see high-tech translation

W

Web Development	is the process of programming websites and functions to be used on the world wide web (Scharl, 2012)
Web Development Literacy	is the process whereby organisational members and clients become oriented to the small or medium firms' work by learning what technologies are being used and how they are being used. Equally important is the translation process

Appendix B: Interview Questions

Opening Questions

Describe for me the nature of your role in the organisation?

Describe for me what it means to you to work at [*organisational name*].

Intermediate Questions

Please describe a typical day.

What is your routine?

Who do you talk to?

How do you communicate with them? (email, which IM is used, texting...)

In what ways do you *prefer* to communicate with clients, co-workers, other organisations? Why?

Working with Clients

How often do you “check-in” with a client when you are working together?

When you are working with a client, how does it make you feel to know their organisational success is being affected by your work?

How do you correct misconceptions the client may have about how the web development process works? (e.g. length of time to finish a project) Have clients ever asked for services you do not offer? How do you explain to them that you don’t offer these services?

Explain the difference between working with a difficult client and an easy client.

Working with Each Other

In the organisation, do you feel some people are better communicators than others?

What role do you think communication plays in your organisation’s day-to-day functioning and success?

When there is something everyone needs to know, how do you find out about it?

Working with Other ‘Web Development’ Organisations

How often to you do work with other ‘web development’ organisations? Do you “check-in” with the other organisation when you are working together?

Technologies Role in Communication

Please describe for me how technology affects the way you communicate.

Closing Questions:

What else do you think I should know or understand about working for [*fill in with organisational name*]?

Is there anything you’ve thought about during the interview you would like to share or clarify?

Demographic Information Collected at the time of the Interview

- Age
- Gender
- Length of time employed at the organisation
- Length of time working in the industry
- Highest qualification (College, diploma, degree, postgrad
- Any formal/informal training around communication?

Follow-up Email Questionnaire

Dear {name},

Thank you for your time and willingness to do an interview with me. As I mentioned in the interview, I am following up with an email to ask a couple of brief follow-up questions.

1. Any additional thoughts on communication in your organisations?
2. Is there anything concerning the interview you would like me to add?

Gratefully,

Appendix C: Coding Summary Sample Tables

Consistent with grounded theory, once data was collected from observations and interviews, they were coded in Nvivo exposing themes, communication strategies, and communication needs (Birks & Mills, 2011; Charmaz, 2006; Glaser, 1992; Glaser & Strauss, 1967). During the open coding process, 162 codes were extracted. Open coding was done by the primary researcher and verified by coding assistants. The coding assistants did line-by-line coding as described in the methodology chapter.

Table 20. Appendix C. Open Codes Samples

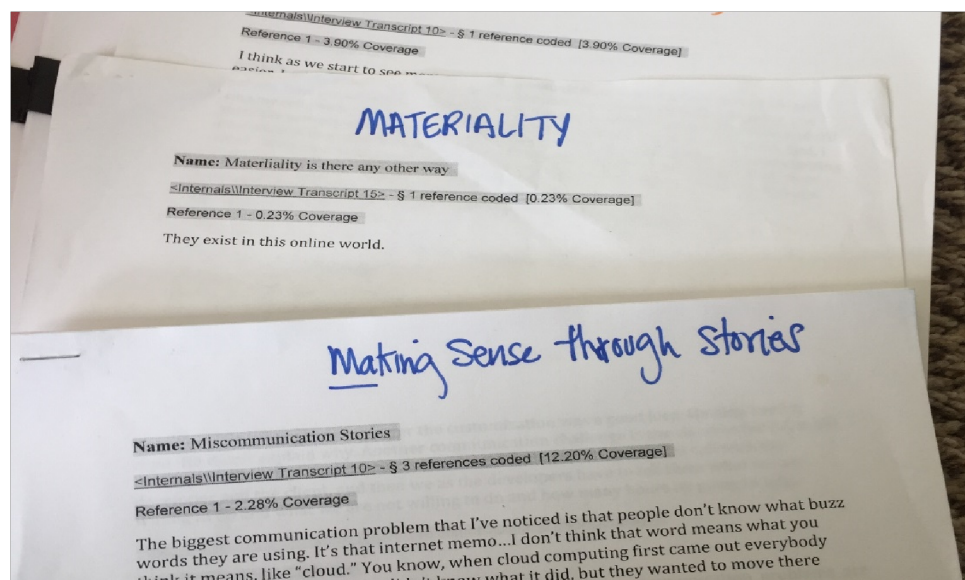
Open Codes Sample

Tensions
Us vs Them
Talking to business people vs. developers vs. every other department in the firm
Local vs Global
Reactive vs Proactive
Quality vs Completion (getting it done!)
Many skills vs. Highly specialised skills
Creativity vs. Management Control
Creativity vs. Client Control or Client Expectations
Communication for Own Organisation vs. Communicating on behalf of the client
Average day vs. Terrible day
Arrogance vs. Humility
Saying no vs. Saying yes
Predetermined communication vs. Strategic communication
Project development vs. Product development
Intercultural communication stories
Language or Cultural barriers
Using existing relationships to network
Metaphors
Interpreting meaning (making sense of high-tech translating)
Feeling confused
Seeing other's perception
Putting clients at ease
Speaking (or not) a common language
Working remotely
Communication Preferences

The next table demonstrates the ways in which open codes were amalgamated to create the focused codes. This table provides a brief example of how the 162 open codes were combined to create 18 focused codes.

Table 21. Appendix C. Creating Focused Codes	
<i>Using Open Codes to Create Focused Codes</i>	
Open codes	Focused codes
Feeling disconnected; experiencing loss	Dealing with negative emotions
Managing conflict inside the organisation; dealing with language barriers; stereotyping; building relationships when working remotely	Managing the internal organising process
Building relationships with clients; working with difficult clients; building relationships when working remotely	Working with clients
Having creative freedom; needing flexibility; silence	Wanting control (Are they hyper-managing the process?)

As discussed in the methodology chapter, focused coding is an important step proceeding the theoretical coding process. Below is a photo of the first phase of focused coding. The titles written at the top of the papers are the focused codes and the printed sheets are the open codes.



In Table 3 are the 18 focused codes with the open codes which created them. This table also includes definitions of the focused codes.

Table 22. Appendix C. Focused Codes from Nvivo

<i>Focused Codes from Nvivo Open Codes</i>	
Tensions	<p>Tensions</p> <p><i>These data points are examples of places opposites existed in the organisational process or in the high-tech translation process.</i></p>
Us vs Them	
Talking to business people vs. Developers vs. every other department in the firm	
Local vs Global	
Reactive vs Proactive	
Quality vs Completion (getting it done!)	
Many skills vs. Highly specialised skills	
Creativity vs. Management Control	
Creativity vs. Client Control or Client Expectations	
Communication for Own Organisation vs. Communicating in behalf of the client	
Average day vs. Terrible day	
Arrogance vs. Humility	
Saying no vs. Saying yes	
Predetermined communication vs. Strategic communication	
Project development vs. Product development	
Intercultural communication stories	<p>Intercultural Communication</p> <p><i>Any data suggesting communication challenges related to intercultural communication was included in this category.</i></p>
Language or Cultural barriers	
Using existing relationships to network	
Metaphors	<p>Metaphor</p> <p><i>Interviewees repeatedly used metaphors to explain their experiences to help me understand what they were experiencing.</i></p>
Interpreting meaning (making sense of high-tech translating)	<p>Deciphering Meaning</p> <p><i>Deciphering meaning was a nuanced difference of the translation process. In this focused code, the interviewees were explicitly describing how they were trying to understand the communication process in their experiences and how to</i></p>
Feeling confused	
Seeing other's perception	
Putting clients at ease	
Speaking (or not) a common language	

	<i>make sense of the language others were using.</i>
Working remotely	Materiality: Is there any other way? <i>These codes exemplify communication acts happening through or with technology hardware and software. This code had the strongest parallels to the current research on materiality.</i>
Communication Preferences	
Relationship conflict	
Using a task management system	
Computer mediated relations	
Materiality	
Organic mediated organisation structure	
What the client hears	Soft Skills <i>The data in this category specifically referenced a myriad of soft skills and characteristics the interviewees deemed important for “successful” communication practices.</i>
Asking questions	
Knowing your audience	
Fighting assumptions	
Humility	
Honesty	
Having conversational skills	
Face-to-face communicating	
Building relationships (in or out of the organisation)	
Communication styles	
Listening	
Bidding or finding process	Translating Process <i>Translating emerged as the most prominent metaphor in the research; not only was it a metaphor for what was happening but it was a specific process as well.</i>
Client expectations	
Client Involvement	
Bridging the (communication) gap	
Ambidexterity	
Accepting the (communication) gap	
Negotiating	
Lost in translation	
Managing the communication flow	
Precision communication (speaking clearly and specifically)	
Relying on developers	

Selling (the wrong idea) unknowingly	
Managing the project vision	
Having an organisational purpose	
Why we need to translate	
Translating	
Translating gone wrong	
Translation	
Translation process	
Project management process	
Web development vs Software development	<p>Development process</p> <p><i>Central to grounded theory research process is to tease out of the data the processes which occur around the general research questions. While this focused category contains some business strategy, it also represents the software development process from a communication perspective.</i></p>
Finding solutions	
Problem solving	
Being in software development	
Consistency in development	
Deterministic communication (communication is determined by client expectations)	
Assuming	
Fail early, fail fast	
Receiving feedback	
Describing the web development process	
Experience is key to success	
Changing firm processes	
Dealing with rapid industry change	
Developing software is different (than creating anything else)	
Using alliances	
Selectively choosing clients	<p>Selectively choosing people</p> <p><i>Surprisingly, a strong social-psychology component emerged as interviewees attempted to describe the type of people they like to work with characteristics of all sorts; whether the person was a client or co-worker. They often used deterministic</i></p>
Being easily offended	
Being bold	
Being confident	
Being patient	
Client personalities	
Cost of needy clients	
Assuming we know what they want	
Dealing with difficult clients	
Increasing clientele	
Letting employees go	

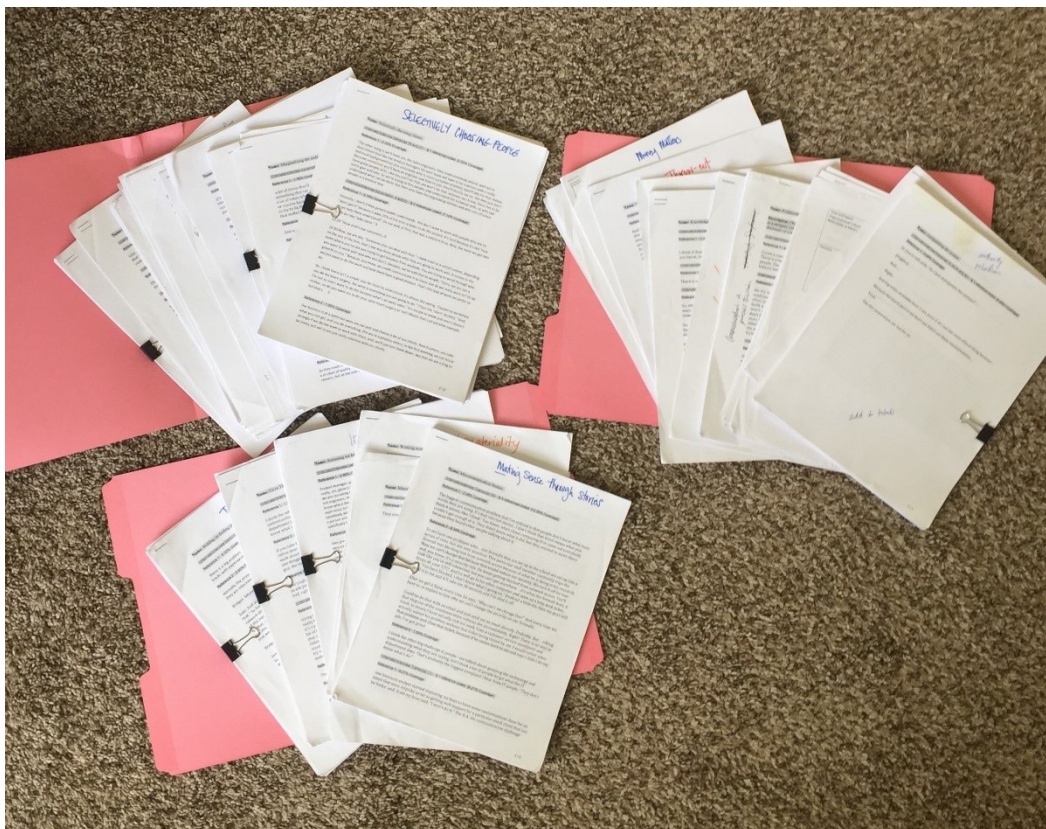
Multitasking	<i>terms such as: their personality or it's just how they are; or, their communication type is determined by their personality.</i>
Motivating	
Recruiting clients	
Training and/or mentoring	
Hiring talent	
Setting expectations	
Employee expectations	
Managing development teams	Managing development teams <i>This focused code combines the process and complexities that emerge in the management of development teams.</i>
Letting them think and pushing the boundaries	
Gaining experience	
Focusing on strengths	
Communication conflict among developers	
Fixing/solving problems	
Knowledge management	Knowledge Management <i>The knowledge management code was explaining attempts at explicit and tactic knowledge.</i>
Documenting as negotiating	
Encouraging others learn the technology	
Lack of communicating through a lack of clear firm policy	
Continuing to learn	
Trying to gain practical experience	
Lack of knowledge	
Time and space Proximity	Time and space <i>This focused code demonstrates the areas when time becomes an issue during the development process or the translation process. Time emerged as critically important to most individuals due to client expectations.</i>
Talking about money	Money Matters <i>Primarily business strategy, money matters exemplifies the areas in which money becomes important during the development or project management process.</i>
Paying out of own pocket	
Spending	
Generating leads through spending	
Getting funding	
What communication means	Defining Communication <i>This focused code defines communication from the practitioners' perspective.</i>
Project management communication connection	
Communication is key	
Assigning identity and stereotypes	

Organisational roles	Assigning identity and stereotypes <i>Defining the identities of self (the interviewee) or others in a way that helps them make sense of behaviours or organisational structure as well as outlining the organisational roles and places or spaces the interviewees occupy in the organisation.</i>
Being task oriented	
Being criticized	
Do everything owners	
Miscommunication stories	Making sense through stories <i>A large portion of the data are stories where interviewees would explain what was happening in their organisation through a narrative where they would speak for themselves and for other (from their perspective) in addition to speaking for the organisation itself. While this code aligns with some research on CCO and ventriloquism, it takes it to another level suggesting that the understanding of the communication event is happening through a narrative/relational experience.</i>
Talking in behalf of the developers	
Speaking for others	
Creativity stories	
Hacking stories	
Personal histories recounted	
Making sense of the experience stories	
Conflict resolution	
Organisational Culture	Organisational Culture <i>In order for data to be included in this category, organisational structure and culture was explicit or implied.</i>
Organisational Structure	
Organisational age matters	
Marketing for self	
Delegating	
Authority	Authority <i>The in process of understanding the translation and development</i>
Acts of rebellion against management	
Accountability	
Power relationships	
Marginalizing the developer	

Misrepresenting information	<i>process, authority became a primary issue. This focused code included open codes where power, rebellion, trust and expertise were discussed.</i>
Developing trust	
Misunderstandings	
Unrealistic expectations	
We're not numbers	
Whose authority	
Management expectations	
Manipulating the system	
Overcommitting	
Hoping to be empowered	
Having no control	
Feeling neglected and/or forgotten	
Feeling disconnected from the organisation	
Distrust	
SaaS early development	Throwing out these open codes since they do not relate to communication.
New marketing strategies	
Not getting too high or too low	
Growing pains	
Failing to plan ahead	
Contrasting growth strategies	
Entering the Latin American market	

After focused coding, the data was reviewed again to provide constant comparative analysis and theoretical saturation (Charmaz, 2014; Corbin & Strauss, 2014; Glaser & Strauss, 1967) which resulted in a second phase of focused coding. The second phase of focused coding was coded from the Nvivo software codes. This process was supported through memo writing and further analysis of the emerging theoretical codes. Below are the results of the second phase of focused coding done by hand. Included, first, are pictures of the printed data and examples of focused hand-coding. After the photos is a table of reorganised focused codes.

The first photo is a picture of all the printed Nvivo codes as organised through the hand-coding process. It is a demonstration of the amount of data and the second phase of focused coding.



The second picture is a closer image of the focused codes and an example of the second phase of focused coding.

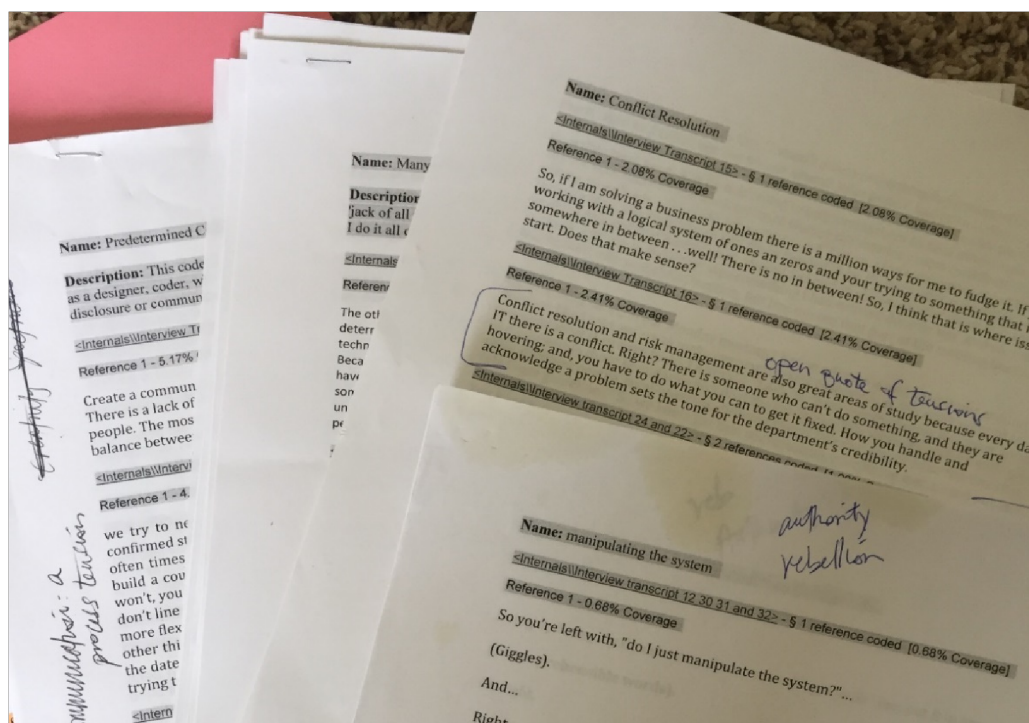


Table 4 below details the re-evaluation of the focused codes. All of the words in bold and italicised were added to the focused codes. Words which have been crossed out were either excluded from the study or were moved to a different focused code.

Table 23. Appendix C. Hand-Coded Focused Codes

<i>Hand-coded, Phase 2 Focused Codes</i>	
Tensions	<p>Tensions</p> <p><i>These data points are examples of places where tensions begin to pull against the organisation as opposites and within the framework of organisational tensions. It is the basics of the emerging entangled tensions.</i></p> <p>CA = Communicative Ambidexterity</p> <p>E = Expectation Tensions</p> <p>DC = Defining Communication as an organisational tension</p>
Us vs Them	
Talking to business people vs. Developers vs. every other department in the firm	
Local vs Global (E)	
Reactive vs Proactive (DC)	
Quality vs Completion (getting it done!) (CA)	
Many skills vs. Highly specialised skills (CA)	
Creativity vs. Management Control	
Creativity vs. Client Control or Client Expectations	
Communication for Own Organisation vs. Communicating on behalf of the client (CA)	
Average day vs. Terrible day (E)	
Arrogance vs. Humility (E)	
Saying no vs. Saying yes (DC)	
Predetermined communication vs. Strategic communication (DC)	
Project development vs. Product development (CA)	
Intercultural communication stories	<p>Intercultural Communication</p> <p>Thrown-out</p>
Language or Cultural barriers	
Using existing relationships to network	
Metaphors	<p>Metaphor</p> <p>Translation and Literacy: A Narrative Process</p> <p><i>Interviewees repeatedly used metaphors to explain their experiences to help me understand what they were experiencing and as part of the translation process.</i></p>
Interpreting meaning (making sense of high-tech translating)	
Feeling confused	
Seeing other's perception	<p>Deciphering Meaning</p> <p>Literacy</p>
Putting clients at ease	
Speaking (or not) a common language	<p><i>Deciphering meaning was a nuanced difference of the</i></p>

	<i>translation process. In this focused code, the interviewees were explicitly describing how they were trying to understand the communication process in their experiences and how to make sense of the language others were using.</i>
Working remotely	Materiality: Is there any other way? Sociomateriality <i>These codes exemplify communication acts happening through or with technology hardware and software.</i>
Communication Preferences	
Relationship conflict	
Using a task management system	
Computer mediated relations	
Materiality	
Organic mediated organisation structure	
	Soft Skills <i>The data in this category specifically referenced a myriad of soft skills and characteristics the interviewees deemed important for “successful” communication practices.</i>
What the client hears	
Asking questions	
Knowing your audience	
Fighting assumptions	
Humility	
Honesty	
Having conversational skills	
Face-to-face communicating	
Building relationships (in or out of the organisation)	
Communication styles	
Listening	
	Literacy and Translating Process <i>Translating emerged as the most prominent metaphor in the research; not only was it a metaphor for what was happening but it was a specific process as well.</i>
Bidding or finding process	
Client expectations	
Client Involvement	
Bridging the (communication) gap	
Ambidexterity	
Accepting the (communication) gap	
Negotiating	
Lost in translation	
Managing the communication flow	
Precision communication (speaking clearly and specifically)	
Relying on developers	
Selling (the wrong idea) unknowingly	
Managing the project vision	

Having an organisational purpose	
Why we need to translate	
Translating	
Translating gone wrong	
Translation	
Translation process	
Project management process	
Web development vs Software development	Development process
Finding solutions	<i>Central to grounded theory research process is to tease out of the data the processes which occur around the general research questions. While this focused category contains some business strategy, it also represents the software development process from a communication perspective.</i>
Problem solving	
Being in software development	
Consistency in development	
Deterministic communication (communication is determined by client expectations)	
Assuming	
Fail early, fail fast	
Receiving feedback	
Describing the web development process	
Experience is key to success	
Changing firm processes	
Dealing with rapid industry change	
Developing software is different (than creating anything else)	
Using alliances	
Selectively choosing clients	Selectively choosing people
Being easily offended	<i>Reassigned to Trust</i>
Being bold	
Being confident	
Being patient	
Client personalities	
Cost of needy clients	
Assuming we know what they want	
Dealing with difficult clients	
Increasing clientele	
Letting employees go	
Multitasking	
Motivating	
Recruiting clients	
Training and/or mentoring	
Hiring talent	
Setting expectations	

Employee expectations	
Us versus Them	
Talking to business people versus developers versus everyone else and every other departments	
Managing development teams	Managing development teams
Letting them think and pushing the boundaries	<i>Reassigned to the development process and the translation and literacy processes</i>
Gaining experience	
Focusing on strengths	
Communication conflict among developers	
Fixing/solving problems	<i>This focused code combines the process and complexities that emerge in the management of development teams.</i>
Knowledge management	Knowledge Management
Documenting as negotiating	<i>Literacy</i>
Encouraging others learn the technology	
Lack of communicating through a lack of clear firm policy	
Continuing to learn	
Trying to gain practical experience	<i>The knowledge management code was explaining attempts at explicit and tacit knowledge.</i>
Lack of knowledge	
Time and space Proximity	Time and space
	<i>Communicative Ambidexterity</i>
	<i>This focused code demonstrates the areas when time becomes an issue during the development process or the translation process. Time emerged as critically important to most individuals due to client expectations.</i>
Talking about money	Money Matters
Paying out of own pocket	<i>Thrown-out</i>
Spending	
Generating leads through spending	
Getting funding	
	Defining Communication
What communication means	
Project management communication connection	
Communication is key	

	<i>This focused code defines communication from the practitioners' perspective.</i>
Assigning identity and stereotypes	Assigning identity and

Organisational roles	Stereotypes
Being task oriented	
Being criticised	
Do everything owners	
	<i>Defining the identities of self (the interviewee) or others in a way that helps them make sense of behaviours or organisational structure as well as outlining the organisational roles and places or spaces the interviewees occupy in the organisation.</i>
Miscommunication stories	Making sense through stories Translation and Literacy: A Narrative Process <i>A large portion of the data are stories where interviewees would explain what was happening in their organisation through a narrative where they would speak for themselves and for others (from their perspective) in addition to speaking for the organisation itself. While this code aligns with some research on CCO and ventriloquism, it takes it to another level suggesting that the understanding of the communication event is happening through a narrative/relational experience.</i>
Talking on behalf of the developers	
Speaking for others	
Creativity stories	
Hacking stories	
Personal histories recounted	
Making sense of the experience stories	
Conflict resolution	
Organisational Culture	Organisational Culture
Organisational Structure	
Organisational age matters	
Marketing for self	
Delegating	
	<i>In order for data to be included in this category, organisational structure and culture was explicit or implied.</i>
Authority	Authority and Power
Acts of rebellion against management	
Accountability	

Power relationships	<i>The process of understanding the translation and development process, authority became a primary issue. This focused code included open codes where power, rebellion, trust and expertise were discussed.</i>
Marginalising the developer	
Misrepresenting information	
Developing trust	
Misunderstandings	
Unrealistic expectations	
We're not numbers	
Whose authority	
Management expectations	
Manipulating the system	
Overcommitting	
Hoping to be empowered	
Having no control	
Feeling neglected and/or forgotten	
Feeling disconnected from the organisation	
Distrust	
<i>Creativity versus management control</i>	<i>Threw out this theoretical code for parsimony May 2018</i>
<i>Creativity versus client control</i>	
<i>Creativity stories</i>	
	<i>Constrained Creativity</i> <i>Constrained Creativity is an entangled tension wherein conflict occurs over who has the authority to create the final project.</i>

The data review combined with the focused codes provided the theoretical codes and are the topics and the subtopics of the findings chapters. Table 5 below outlines the theoretical codes which represent the combination of literature and data.

Table 24. Appendix C. Theoretical Codes		
<i>Theoretical Codes</i>		
Theoretical Code	Focused Codes	Topics that align with the data from the current literature
Organisational Tensions	Defining Communication	Corporate language-based Communication Avoidance (CLBCA)

	Communication Ambidexterity	Ambidexterity
	Expectations	Project Management
Trust and Authority	Authority and Power	Critical Organisational Studies
	Trust	Trust within organisations
	Stereotypes	Stereotyping and Organisational Culture
	Constrained Creativity	Creativity in the Tech Industry
Soft Skills and Sociomateriality	Soft Skills	Interpersonal communication skills
	Sociomateriality	Sociomateriality and materiality
Literacy and Translation	Translation and Literacy: A Narrative Process	
	Literacy	
	Translation	
	Literacy and Translating Process	

The coding process combined with dialectical tension analysis also produced an entangled tension analysis process. The entangled tensions are listed in the next table. They are a combination of interview data, the literature, and observations; and, they were interwoven into the relevant chapters.

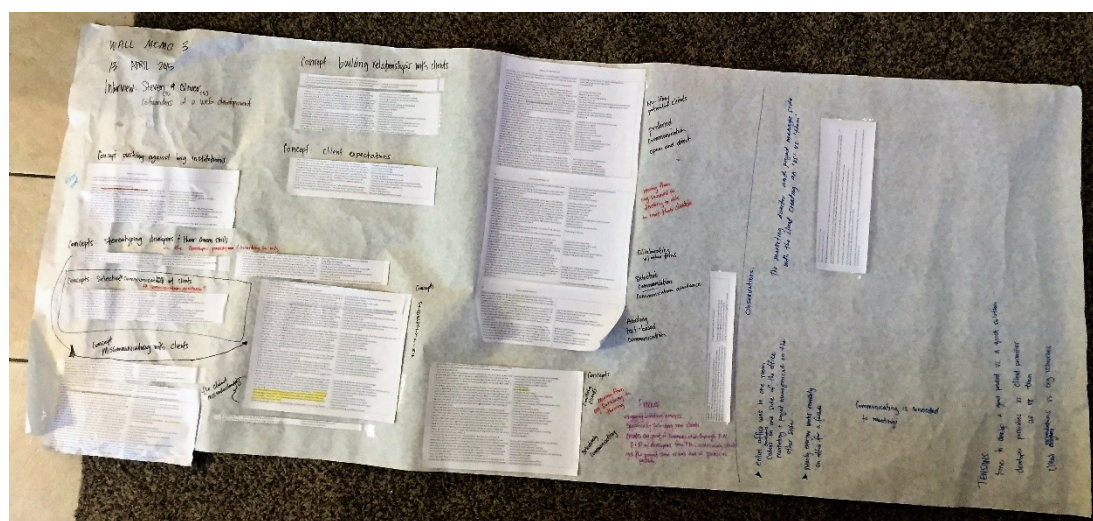
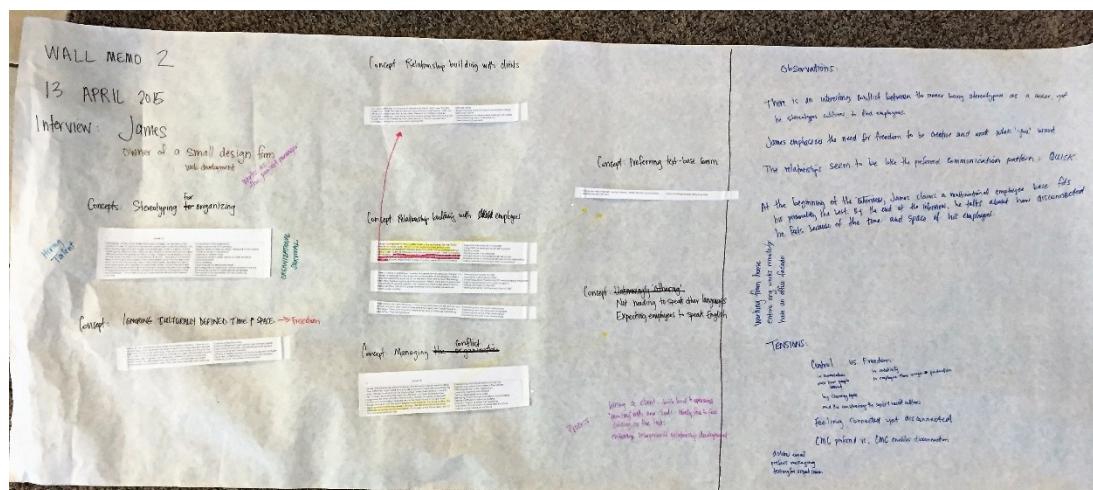
Table 25. Appendix C. Entangled Tensions		
<i>Entangled Tensions</i>		
Tension Title	No. of Participants	No. of Incidents
<i>Ambidexterity</i>		
Quality—Completion (getting it done!)	5	9
Product Development—Project Development	3	3
<i>Trust</i>		
Us vs Them	10	29
Talking to business people vs. Developers vs. every other department in the firm	14	51
Arrogance—Humility	1	3

Local—Global	6	11
<i>Creativity</i>		
Creativity—Management Control	5	6
Creativity—Client Control or Client Expectations	1	6
Saying no—Saying yes	7	7
<i>Communication</i>		
Predetermined communication—Strategic communication	4	4

Reactive—Proactive Communication	2	2
Strategic communication	13	22
Communication avoidance	7	15
<i>Authority</i>	9	24

Appendix D: Pictures of Additional Wall Memos

Wall memo one was featured in the Methodology Chapter. Included here are wall memos 2 and 3. These were my initial attempts at constant comparative analysis and, therefore, theoretical sensitivity.



The other two wall memos were part of the focused coding phase as I was trying to interpret the data and the relationships among the codes and concepts which were emerging. In the first photo, I have the paper labelled Memo A, B, and C in different colours. Each analysis and memo were completed on a different day and concerned different connections and relationships. Memo A was an early attempt in the research to conceptualise definitions. The purpose of wall memo B and C were to explore relationships of the concepts in a visual format.

BIG COMPARATIVE TENSIONS

AND OBSERVATIONS

MEMO D

14 APR 15

Stunting org growth by
limiting clientsorg
organic growth vs. stunting growth

Misunderstanding of the nuanced difference
of rapid web development and other types
of engineering → hardware or construction

It could be this is assumed
technology and software is so high velocity, that they don't
even realize it's a different difference than
other service industries.

organic growth enables
particularly, a reactive communication strategy.

organic growth is also creativity and flexibility → a freedom to do
what is needed for
organizational survival

Not wanting to communicate, viewing it as a burden; yet
feeling completely 'put off' when people don't communicate to
organizational needs.

Lack of defining the difference 12 May 15

BETWEEN
Software development
WEB development

5/1/15

Project managers are defining communication management; it reads more like knowledge management
defining comm management vs. knowledge management

7/8/15

the organizing process in these firms is extremely informal → almost
less than organic