Small Businesses Encounters with Information Technology

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SMALL BUSINESSES ENCOUNTERS WITH INFORMATION TECHNOLOGY

(Thesis Format: Monograph)

by

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Graduate Program in Business Administration

A thesis submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy

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Abstract

This dissertation advances the concept of IT encountering, defined as the process whereby individuals pay attention, interpret and respond to cues suggesting changes to IT, in ways that appear sensible to them, and it studies IT encountering in the context of small businesses.

I review the literatures on organizational IT adoption and IT selection, and conclude that these literatures have relied on assumptions which leave unattended important aspects of the process leading to choice: the adoption literature presupposes the saliency and significance of a focal technology to a decision maker, and the IT selection literature generally assumes that suitable IT alternatives are known to the individual making choices. The reliance on these assumptions has resulted in blind spots, which have in turn led to deficiencies in our conceptualizations. I discuss these blind spots, some historical and methodological reasons behind them, and their theoretical implications (i.e., the perpetuation of the pro-innovation bias, the absence of search from our theories, and the unexplained gaps between competing explanations of IT choice).

The IT encountering perspective draws primarily on the behavioural, sensemaking, and mindfulness research traditions. Those foundations inform the empirical study, which was based on a longitudinal qualitative design, and included event-driven interviews with small business owners. The findings of the study uncover crucial aspects of the cognitive work and behavioural responses carried out by business owners during IT encounters. These aspects are composed together into a process model. My findings are consistent with previous work in noting a considerable time lag between awareness and adoption of

IT innovations among small businesses, and in highlighting the crucial role of knowledge

therein. The findings also differ from prior research on this topic, especially by

considering a much wider range of responses and outcomes lying in between adoption

and rejection of IT (e.g., tinkering, experimentation, downscaling), and by taking into

account the dialectics and temporal limits of effected IT change.

This alternative perspective opens up research avenues beyond the context of study, and

can also guide research efforts more attuned to the views and needs of such fundamental

socioeconomic actors as small businesses.

Keywords

IT encountering, small businesses, sensemaking, mindfulness, IT adoption, IT selection
and evaluation, IT choice, process models

Co-Authorship Statement

I hereby declare that this thesis incorporates some material that is a result of joint

research. Chapters Two and Three were co-authored with Dr. Nicole Haggerty. As the

first author, I took the lead on these chapters. For Chapter Two, I designed and conducted

the literature review, and I analyzed and interpreted the findings of the literature review.

For Chapter Three, I identified the theories to be used as theoretical foundations, and I

made all decisions regarding the exposition of these ideas and their applicability to the

small business context. I prepared the first complete drafts of both chapters. Dr. Haggerty

contributed as an adviser throughout the research process and by refining, and revising

the complete drafts. With the above exceptions, I certify that this dissertation and the

research to which it refers, is fully a product of my own work.

Dedication

En Memoria de Richie Espinosa

Por sus firmes convicciones y profundos escepticismos.

Acknowledgements

Very few accomplishments in my life have granted me the opportunity to think back through the time invested, reflect upon the experiences lived, and put down in writing my feelings of gratitude to the many people who have, in so many ways, enriched my work and contributed to my personal growth. I take this opportunity wholeheartedly.

First, I thank my supervisor, Nicole Haggerty. Her unabating support and mentorship have been inexhaustible sources of confidence and courage for me. Ten years ago, in her own thesis, she thanked her advisor and wished she could one day offer positive, creative and passionate guidance to her own students. Nicole: you have excelled at all those areas!

I also thank Debbie Compeau, for her thorough reading and eye-opening comments, and Claus Rerup and Mark Zbaracki, for engaging so generously and enthusiastically with my emerging ideas. In the IS area group, Chris Higgins, Darren Meister and Derrick Neufeld were available to offer advice, and spotted opportunities for improving this work. I am also thankful for their help.

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The Ivey PhD community has been incredibly supportive. Some colleagues stand out for their kindness. Karen MacMillan skillfully balanced her time between preparing for

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Chapter 1   Introduction

1.1 Motivation

What happens before a certain piece of information technology (IT) arrives at an organization? This research seeks to advance an alternative perspective to think about and study this question, and focuses on the specific context of small businesses to develop such a perspective in a highly situated fashion. In this thesis, I develop the argument that information systems (IS) research has failed to capture essential aspects of the period of time before IT enters an organization. More precisely, I claim that the two main literature streams dealing with this period, namely IT adoption and IT selection and evaluation, have made assumptions which leave unattended important elements of the process taking place during this period. I will show how research on IT adoption has assumed from the start the saliency of a focal IT to be adopted, but has not paid attention to how or why such IT gets to stand out and becomes worthy of consideration against competing issues requiring attention and competing solutions, while research on IT selection and evaluation has presupposed that alternatives are known to the decision maker and has focused on describing how a set of previously defined alternatives is or should be evaluated until a final choice is made, but has failed to study the process whereby decision makers arrive at a pool of alternatives, if and when they do.

These blind spots in the literature may be understandable in light of the history of the IS field, but I sustain they are far from trivial. First, we must factor in the dynamism and complexity of today's IT marketplace. Previous IS research has noted that IT innovation

concepts abound: at any given time several of them might be competing against each other for attention (Swanson and Ramiller 1997), and their popularity varies over time (Currie 2004; Wang and Swanson 2007); this implies that allocation of attention can be a critical factor in determining which IT, if any, is taken up (Wang 2009). Similarly, the IT marketplace is a greatly complex space for anyone trying to find their way around it (Adomavicius et al. 2008). It contains fairly diverse players, ranging from large multinationals to promising start-ups to informal programmers, it offers a multiplicity of products and services under various deployment methods (e.g., on-premise vs. cloud), licensing types (e.g., open source, free or proprietary), customization alternatives (e.g., from off-the-shelf to bespoke software), and delivers these products and services for a variety of hardware and software platforms.

Further, time, money and knowledge can be scarce resources in organizations. As far as IT decisions are concerned, these resources are known to affect the allocation of attention (Ocasio 1997) and the amount and nature of search conducted (Levinthal and March 1993), hence the process leading to a technological choice.

We only need to juxtapose the image of a typical small business decision maker, likely to be limited in their time, money and knowledge of the IT marketplace, against this dynamic and complex space, to notice an enormous mismatch. Sensitive to this situation, I posit that the owners of small businesses do not 'adopt' a certain IT, nor do they 'select and evaluate' competing IT alternatives, as it were. Rather, in the course of their personal and business experiences, they stumble upon situations where IT is involved and respond to these situations in some way. Extant research can only insufficiently explain how small business owners cope with these situations on a regular basis. Quite simply, we do not

have enough specific knowledge concerning how or why IT gets noticed (or missed) by organizational decision makers, under which circumstances decision makers consider IT to be an appropriate answer to their concerns, or whether or not they develop a pool of competing IT products as potentially suitable alternatives. After careful study, it is my opinion that a considerable portion of extant research, by trying to fathom the factors that enable the adoption of certain IT products, has been more attuned to the needs of the entrepreneurial communities aiming to diffuse those IT innovations (Swanson and Ramiller 1997; Wang and Swanson 2007) than to the needs of organizations as they come across IT and try to respond in a sensible way, and that our knowledge base is thus insufficiently developed to serve organizations adequately in this regard, especially such resource-constrained organizations as small businesses.

1.2 Research Question, Theoretical Foundations and Empirical Approach

In this thesis, I put forward IT encountering as an alternative theoretical perspective with which to illuminate the processes whereby an organizational decision maker notices IT and develops responses to noticing IT. I define an IT encounter as any situation whereby a decision maker attends to cues leading them to notice or consider the addition of a certain piece of IT to their business, interprets these cues, and then responds to them in a way which might or might not include the acquisition of new IT. Through an IT encountering approach, I explore the nature of these cues, the dynamics of attention and interpretation and the responses carried out by small business decision makers. Based on this definition and the context of study, the broad research question guiding this thesis is:

How do small business decision makers encounter IT?

In light of that general scope statement, domain overlaps both with IT adoption and IT selection and evaluation research are inevitable. What is different, though, is that I start both conceptually and empirically before an IT instance, or a set of competing alternatives, is salient to the small business decision maker, I aim to understand how the IT encounter happens, and I seek to explain behavioural responses within the context of the IT encounter, and not as decisions to adopt or select a technology as if the technological instance or the competing alternatives had been visible the whole time.

To further explain what areas might be better illuminated by an IT encountering lens than they have been in the past by IT adoption or IT selection and evaluation lenses, I will use e-commerce as an example of an archetypal IT class whose adoption by small businesses has been strongly promoted and carefully tracked by IS researchers for quite some time.

A focus on e-commerce adoption among small businesses would promote several interlocked sensible statements: e-commerce is an imperative for any business aiming to grow by reaching out and selling to a global customer base, many small businesses should then strive to adopt e-commerce, and research can help elucidate the factors driving e-commerce adoption among these businesses. The general, albeit simplified, expectation would be that business owners who are IT literate, have been sensitized to the importance of e-commerce, receive some financial assistance and are located in regions with good connectivity, should then be prepared to get an e-commerce solution. Similarly, a focus on e-commerce selection and evaluation would consider a number of competing alternatives to adopt e-commerce, such as developing e-commerce capabilities into the business website, or setting up a merchant account on available e-commerce platforms, such as Amazon or eBay, and would generate knowledge around the criteria,

techniques and processes small businesses should employ, or do in practice follow, to select among these competing choices.

Seeing decision making around e-commerce through an IT adoption lens, or an IT selection and evaluation lens, though, tends to divert our attention from the issues at play before the business owner defines e-commerce as a course of action, thereby limiting our ability to explain how such issues might affect ensuing actions. For instance, these lenses would not let us see how or why e-commerce becomes salient as an issue, what business owners do to get to adopt e-commerce when they decide that they need it (e.g., do they search for alternatives? How so?), or what they do when they decide that they will not adopt e-commerce (i.e., do they give up on selling abroad, or do they find alternative routes to reach an international customer base?). An IT encountering lens should shed light precisely on those areas.

My theoretical understanding of IT encountering rests upon two fundamental pillars. First, it is based on a conceptualization of small businesses as organizations characterized by independent ownership, owner-centralized decision making, strong reliance on owner's limited resources and capabilities for operation and decision making, dependence on a generally small set of human and organizational firm-level resources and capabilities, and an overlap between the personal domain and the business domain as a source of tension and action. Second, it is informed by three literature streams which have extensively theorized on the areas of attention, interpretation and responses to environmental stimuli. These literature streams are organizing and sensemaking (Weick 1979; Weick 1995), the original Carnegie School's tenets about attention, search and learning at the individual level (Cyert and March 1963; March and Simon 1958; Simon

1947), as well as more recent developments building upon that tradition (Greve 2008; Levinthal and March 1993; Ocasio 1997; Ocasio 2011), and organizational mindfulness (Weick et al. 1999).

The study uses a longitudinal qualitative research design. Data were primarily collected through semi-structured interviews with a demographically diverse group of small business owners at two points in time. 29 businesses owners were interviewed in 2011 and 13 of them were interviewed a second time in 2014. Interview questions were centred on concrete events, following critical incident technique guidelines (Chell 2004; Flanagan 1954). Data analysis was highly iterative, but can be meaningfully summarized in three steps. At Step 1 I conducted an inductive analysis using data collected at time 1, developed a set of preliminary findings and a process model, and included these findings in a report that I used to check the credibility of the interpretation among participants. At Step 2 I engaged in a series of oscillations between the data and various literatures, which helped refine my understanding of those data and strengthen the theoretical direction of my work. At Step 3, I added the data at time 2, and formulated a data analysis strategy based on event sequences, which I then applied to all collected data. This new strategy was rooted in the attention to cues – interpretation – responses triad, and allowed me to track how those processes evolved over time at small business sites.

It is important to note that the study started before I began to use the label *IT encountering* to describe the phenomenon of interest. In fact, my use of this label to describe the topic of my research only emerged at Step 2, and it is the result of iterating between the literature, my empirical work, and insightful conversations with several individuals. My experience is consistent with descriptions about the processes of data

analysis and theory building from qualitative data (Langley 1999; Miles and Huberman 1994).

1.3 The Focus on Small Businesses

The rationale for selecting small businesses as the context of study, and the implications this choice has had in the research conducted must be discussed right from the start, if the work presented in this document is to be adequately understood.

Two reasons substantiate the use of small businesses as the context of study. First, the IT encountering perspective emerges from my observation of a fundamental mismatch between the complexity and dynamism of today's IT marketplace and resource constraints generally faced by organizations, which complicates the organizational processes leading to IT choice[1]. In light of this observation, the IT encountering perspective seeks to specifically explain how issues concerning attention, interpretation and responses to IT cues occur and affect organizational IT innovation processes and outcomes in the presence of resource constraints. By focusing on small businesses, as an extreme case of severely resource-constrained organizations, I allow resource limitations to stand out and be explored more distinctively than they otherwise might.

Second, I am personally inspired by the value and impact academic research can have in society, and believe that awarding research attention to small businesses is a socially relevant task for IS researchers. Small businesses are numerous and of great socioeconomic importance. In OECD countries where comparable cross-country information is available (OECD 2010), small businesses (0 to 49 employees) account for

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[1] Hereafter, I use IT choice to refer jointly to IT adoption and IT selection and evaluation.

96.8 to 99.4 percent of total companies, 38.9 to 68.7 percent of total private employment, and 32.9 to 55.4 percent of private economic value-added. Microbusinesses alone (0 to 9 employees) account for 76.9 to 90.7 percent of total companies, 19.1 to 46.6 percent of total private employment, and 18.4 to 31.5 percent of private economic value-added. Furthermore, small businesses are an enduring trend of post-industrial societies. At a macro level, deregulatory macroeconomic policies have been associated with the rise of structural unemployment in many places around the world, which in turn has resulted in the proliferation of small and often informal economic units – i.e., small businesses – (e.g., Castells and Portes 1989; Harvey 1989; Portes and Hoffman 2003). At a more micro level, it is a consistent observation across scholars working in different fields and under different research paradigms that employers in post-industrial times have increased the use of flexible work arrangements, including but not limited to self-employment in the form of contracting work (e.g., Barley and Kunda 2001; Sennett 1998); individuals working under these kinds of work arrangements can be understood as microbusinesses insomuch as a formal employment relationship no longer exists. Therefore, studying small businesses is not only of paramount social significance, but also very timely.

IT encountering is not intended to become a particularistic theoretical perspective focused solely on small businesses, but a perspective of broader applicability within our field. Indeed, this perspective has emerged from an observation of blind spots identified in the whole body of IS research on organizational IT choice, and not just in the literature on small business IT choice, and has built upon organizational theories which are not specifically geared towards small businesses, but towards organizations more broadly understood. However, making small businesses the context of study, and taking that

context seriously, has had important implications for how this research was conducted and the extent to which its empirical findings can be transferred to other contexts in future research. A first implication is that in in my theoretical development and empirical work I have striven to keep the specific features of small businesses constantly in sight, with the purpose of developing an explanation of IT encountering that closely reflects the central characteristics of this context. In keeping with this purpose, I carry the small business context along throughout the investigation and the text more than it is customary. This context informs not just the methods, the findings and the discussion connecting the findings back into the literature; it also influences the scope and depth of the review of prior literature so as to consider previous work on small businesses, and it helps give focus to the presentation of theoretical foundations.

A second implication concerns the transferability of the findings. The use of small businesses as the context of study limits the possibility of directly extrapolating the study findings to other contexts, especially to organizations whose core features depart significantly from the five characteristics I used to define small businesses in this research and inform theoretical development (i.e., independent ownership, owner-centralized decision making, strong reliance on owner's limited resources and capabilities for operation and decision making, dependence on a generally small set of human and organizational firm-level resources and capabilities, and an overlap between the personal domain and the business domain as a source of tension and action). However, arriving at a broader understanding of IT encountering beyond the small business context is desirable, and can be achieved by future research. I provide some guidance in this regard in Chapter Seven.

1.4 Contributions

This dissertation aims to make two primary contributions. The first and most important contribution is the introduction of the concept of IT encountering as an alternative and relevant approach to study what happens before IT enters an organization. This early moment of IT innovation has been understood primarily from an adoption perspective, which assumes the saliency of a focal technology to a decision maker, and seeks to shed light on the factors that facilitate or hinder behavioural intention to acquire or start using IT, and secondarily from an IT selection and evaluation perspective, which assumes that suitable IT alternatives are known to the individual making choices. These perspectives, however, do not fully illuminate the IT encountering process. That is, they do not allow us to comprehensively explain how decision makers, often limited in their knowledge of the IT marketplace and faced with competing demands on their time and financial resources, attend to cues suggesting IT, interpret these cues and respond to them. The IT encountering perspective developed through this research can contribute to theory by shedding light on these issues.

The second intended contribution, closely related to the first one, is advancing a theoretically plausible and empirically grounded understanding of how IT encountering occurs in the specific context of small businesses. The findings of the empirical study reveal key elements of the cognitions and behaviours carried out by a sample of small business owners during IT encounters. These elements are organized into a process model which both converges and diverges from prior research in important ways. On the side of convergence, I notice there can be a considerable time lag between awareness and adoption of an innovation (Rogers 2003) among small businesses, and I point to

knowledge as a crucial pre-requisite for IT innovation. Points of divergence include the identification of a wider range of magnitudes of IT change, vis-à-vis a binary set of outcomes of interest considered in most prior research (i.e., adoption and non-adoption), the tracking of changes in these responses over time, the exploration of cognitions and behaviours taking place during the time IT has not been adopted, and the recognition of process dialectics, which is not explicitly incorporated in the majority of prior work in this area. Although the empirical work has sought to address the specificities of small businesses, the concept and general process framework of IT encountering resulting from this research might appeal to the IS field as a whole. In particular, the model can assist in the study of under-theorized moments of IT innovation in other contexts, and can shed some light on how resource constraints impinge upon IT choice.

The outcomes of this research can also contribute to practice, chiefly by challenging dominant normative ideals about the appropriateness of IT innovation for small businesses regardless of contextual particularities, and also by supporting, both theoretically and empirically, a competing set of normative principles which do not consider the desirability of IT innovation as an absolute, but weigh the advantages of IT innovation against the demands imposed by the business owner's personal and business context. Such alternative normative principles, if appropriately refined and disseminated, can help lay the foundations for a more context-aware and accepting institutional environment, where different responses to IT innovation are not judged on the basis of how much new IT they involve, but on the extent to which these responses adequately address the issues faced and action levers possessed by small businesses. Putting on the table a new language and a fresh understanding with which to flesh out practitioner and

academic oriented conversations around IT innovation among small businesses was the original goal of this research, and it is my view that the research reported here goes a long way in fulfilling that goal.

1.5 Dissertation Outline

The remainder of this dissertation is organized as follows. Chapter Two reviews prior IS literature on organizational IT choice, notes that prior research has unintentionally formed two 'blind spots' (i.e., unattended aspects of the organizational processes taking place before IT enters an organization), and traces some of the origins and conceptual consequences of these blind spots. Chapter Three introduces the notion of IT encountering, discusses its theoretical foundations and synthesizes these foundations so as to inform empirical work in the context of small businesses. Chapter Four briefly introduces conceptual development about small businesses. Empirical work is presented in Chapters Five and Six: Chapter Five contains the methods, Chapter Six describes the findings. Finally, Chapter Seven concludes by discussing the findings in light of existing literature, stating the contributions and limitations of this work, and suggesting avenues for future research.

Chapter 2 Previous Research

This chapter reviews prior IS literature on organizational IT adoption to show how it presupposes the saliency and significance of a focal technology to a decision maker, and the literature on organizational IT selection and evaluation to reveal that it assumes that suitable IT alternatives are known to the individual making choices. Herein, I argue that the reliance on these assumptions has resulted in two blind spots, the first one pertaining to the processes of attention and interpretation that make a certain technology stand out, against competing problems and solutions, to a decision making unit, and the second one concerning the process of developing courses of action in face of incoming stimuli. To develop this argument, I review the general literatures on organizational IT adoption and IT selection and evaluation, and I also pay special attention to prior studies addressing these topics in a small business context, to confirm that my argument also holds in this segment of the literature.

After laying out this argument, I move to provide some potential explanations for the existence of these blind spots in the literature; these explanations are related to the history of knowledge construction in the field and to methodological difficulties. I close the chapter with a discussion about three deficiencies in our conceptualizations of the IT innovation process which are associated with the aforementioned blind spots, namely the pro-innovation bias, the notable absence of search from existing theories of IT choice, and the unexplained gaps between competing explanations of IT choice.

2.1 The Organizational IT Adoption Literature

Organizational IT adoption is one the most thoroughly studied topics in the IS discipline. Prior literature is even larger if one holds the view that this topic, rather than being IS-specific, is an instance of the larger and intermeshing topics of organizational innovation and diffusion of novel technologies and management practices. In addition to the many theoretical and empirical studies on the topic, a number of thorough literature reviews, syntheses and reflection articles have emerged over the last fifteen years, centred on IT innovations in particular (Fichman 2000; Fichman 2004; Jeyaraj et al. 2006; Williams et al. 2009). Rather than attempting to replicate these efforts, the following discussion will draw on those sources to provide some distinct insights concerning the main objects of study, theoretical approaches, empirical strategies, and features of the accumulated knowledge produced by this body or research. Such insights, extracted first from the literature on organizational IT adoption at large, and then from the literature on small business IT adoption specifically, will be the launch pad for developing the argument about the first blind spot: the general disregard for the processes of attention and interpretation that impact how or why a certain piece of IT gets to stand out and become worthy of consideration against competing solutions for the same issue, and competing issues requiring attention.

2.1.1 Organizational IT Adoption: An Abridged Account

In his overview of the literature, Fichman (2000) distinguishes between two general styles of research: *adopter* studies, centered on the questions of what determines the propensity of organizations to adopt innovations over time, or to adopt a particular innovation, and *diffusion modeling* studies, which address the question of "what

determines the rate, pattern and extent of diffusion of an innovation across a population

of potential adopters" (p. 107). He further notes that the vast majority of available studies

in the IS field are adopter studies. These studies are also the focus of most recently

published literature reviews (Jeyaraj et al. 2006; Williams et al. 2009), and they are better

connected to the topic of this dissertation. Thus, the remainder of the section will

concentrate on issues pertaining to adopter studies.

Even though these studies do not discover diffusion rates and patterns, most of them have

followed what can be viewed as a diffusionist approach. That is, they are concerned with

the factors that enable the spread of an innovation across a target population, and more

specifically with adopter-related factors that, if present, result in greater adoption of the

innovation (Fichman 2004). Indeed, it has been found that diffusion of innovations

(Rogers 2003) is the theoretical approach that researchers have drawn on the most in

prior literature (Jeyaraj et al. 2006; Williams et al. 2009).

In his work, Rogers (2003) synthesizes not only his own research, but several decades of

study about the diffusion of a broad range of innovations, conducted by many scholars

operating in diverse fields, and addressing issues related to attributes of innovations,

characteristics of adopters, communication channels, innovation generation, and diffusion

processes. An important component of Rogers' synthesis is what he calls the innovation-

decision process, a stage model where he lays out the phases that adopters go through

before and after adopting the innovation. Figure 1 presents the first three stages theorized

by Rogers, covering the moments preceding the adoption or rejection of the innovation

by the adopter (thus more closely related to my topic of study). In essence, the model

starts by recognizing that some prior conditions, such as a *prior practice* and *felt*

problems or needs, should be present for diffusion to take place. The knowledge stage

requires awareness of the innovation, which is significantly influenced by the

characteristics of the adopting unit, or individual, including their *socioeconomic status*,

personality traits and *communication behaviours*. Once there is awareness of an

innovation, the model moves to persuasion, which is primarily affected by the perceived

characteristics of the innovation (i.e.., whether it is perceived as *more advantageous* than

prior practices, *compatible* with values, experiences and needs, *complex* to be understood

and used, *triable* on a limited basis, and its results *observable* to potential adopters). At

the decision stage, the potential adopter decides to either adopt or reject the innovation.
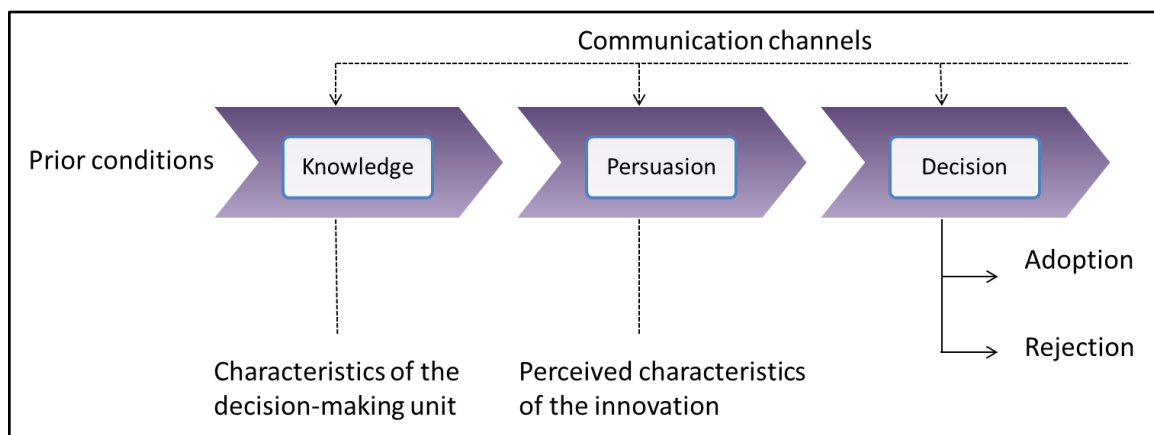
Figure 1: Three first phases of Roger's (2003) innovation-decision process

Throughout the process, communication channels are the means used to pass information

related to the innovation from one individual to another, and include mass media,

interpersonal channels, and the Internet more recently.

A connected line of research has posited that innovation adoption decisions are affected

by demand-pull and supply-push factors, which are in turn subjected to institutional

forces (Attewell 1992; Cooper and Zmud 1990; King et al. 1994), and has investigated

factors on each side. Demand-pull factors are those that increase the adopter's need for change, such as performance gaps (Rai and Patnayakuni 1996). Supply-push factors are those that fuel the development and commercialization of inventions, raise awareness of the innovation, or facilitate its comprehension by intended adopters (Attewell 1992; King et al. 1994).

While these earlier works did not assume that the innovation was necessarily known or relevant to organizational adopters, the same cannot be said about later research. In the last two decades, when the great majority of adoption studies have been published – 96 percent of the articles sampled in Williams et al.'s (2009) literature review – the prevailing trend in research that draws on diffusion of innovations has been to take one or more of the five perceived characteristics of innovation advanced by Rogers, use them as independent variables, along with factors related to the adopting unit and the external environment, in a model designed to explain the extent of adoption of a particular innovation (e.g., e-commerce, computer-aided software engineering [CASE] tools, enterprise systems), and test the model using survey data and inferential statistical technics for analysis (Fichman 2000; Fichman 2004; Jeyaraj et al. 2006; Williams et al. 2009). In this way, the field has amassed enormous knowledge about the factors that facilitate organizational IT adoption, has produced highly predictive models, and has made huge progress in building a cumulative research tradition[2].

These accomplishments are all of paramount importance, but they have also led to justified criticism. In particular, these studies, added one after another, have cemented a

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[2] As mentioned earlier, it is beyond the scope of this thesis to summarize the knowledge that this body of research has produced. Interested readers are directed to the aforementioned literature reviews and critical discussion articles which have done this very effectively, and to seminal empirical articles on the topic (e.g., Chau and Tam 1997; Chwelos et al. 2001; Plouffe et al. 2001).

dominant research template which eclipses alternative understandings of the phenomenon of interest (cf., Oliver and Romm 2002 or Saccol and Reinhard 2006, respectively, for a critical and an existentialist perspective on this topic). It has also been suggested that the scope of this dominant research template can be meaningfully expanded if some of its assumptions are relaxed. As far as this dissertation is concerned, the use of this template has resulted in a generalized neglect of issues concerning how attention and interpretation to IT stimuli emerge, and that is the point from which my research can expand the scope of prior work. A more detailed discussion on this matter is offered in section 2.1.3.

2.1.2 Small Businesses IT Adoption

For reasons mentioned in the previous chapter, the empirical setting I have chosen for this research is small businesses. A conceptual definition of small businesses will be presented in Chapter Four, but at this point it is important to mention that this definition stresses limited resources and capabilities as constitutive features of these businesses.

Prior studies on organizational IT adoption have often chosen large organizations as their empirical setting. For instance, studies on the adoption of software process technologies (e.g., CASE tools, database management systems) have selected as participants senior and middle-level managers of IT departments within relatively large firms (e.g., Fichman and Kemerer 1999; Grover et al. 1997; Rai and Patnayakuni 1996). In this setting, it seems reasonable to assume that IT managers are aware of the innovations being studied.

The same assumption might not hold among small businesses, due to their limited knowledge resources and capabilities. In many small businesses, there are no dedicated IT personnel, and decisions are concentrated in the owner, who is not necessarily aware

of IT innovations and might have other issues competing for their attention. In light of these differences and the purpose of this dissertation research, it is relevant to determine whether prior work looking specifically at small business IT adoption has assumed that small business decision makers are aware of the focal IT and see it as relevant to their problems and needs, or, on the contrary, has distinctively explored issues related to awareness and attention. To answer this question, I conducted a more focused literature review. Further details about the rationale and procedures for locating and selecting studies to be included in this review are provided in Appendix A. The remainder of the section summarizes the research findings emerging from the review.

In keeping with broader research trends, initial interest in IT adoption by small businesses was centred on elucidating the factors that could best predict IT uptake by small businesses. From those early works, we learned that certain characteristics found in decision makers, the organization and the environment were key determinants of adoption. Specifically, IT skills and an involved, positive attitude towards IT at both the CEO (Thong 1999) and the top management level (Cragg and King 1993; Delone 1988; Raymond 1985) increased adoption. Within the organization, IT knowledge, time and financial resources were all positively associated with adoption, and lack thereof was considered an inhibitor (Cragg and King 1993). Finally, various actors in the business environment could be the source of external pressures to which small businesses felt compelled to respond by adopting IT (Cragg and King 1993). A study by Iacovou and his colleagues (1995) represented an important milestone which integrated and extended existing knowledge about facilitators of adoption among small businesses into a single model. The model considers perceived benefits of IT, organizational readiness –

comprising IT knowledge and financial resources as two distinct dimensions, and external pressures as the key factors explaining IT adoption decisions by small businesses.

Taking advantage of this and other theoretical developments within and outside the field, subsequent research efforts have investigated how whole theoretical models, as opposed to sets of factors, could explain the adoption of IT among small businesses. Important theories which were tested and largely supported were diffusion of innovations (Kendall et al. 2001), the theory of planned behaviour (Harrison et al. 1997), and the technology – organization – environment framework (Kuan and Chau 2001). Despite the increasing interest in using whole theories as opposed to individual factors, evidence continued to suggest that some factors had higher influence over adoption outcomes than others in the context of small businesses. Under different theoretical guises, factors which have regularly been found to be among the strongest determinants of adoption are perceived relative advantage (Rogers 2003), reinterpreted in this context solely as the expected instrumental benefits to be gained from adopting IT[3] (Kendall et al. 2001; Poon and Swatman 1999; Thong 1999), top management support (Caldeira and Ward 2002), external pressures, IT knowledge and financial resources (Harrison et al. 1997; Kuan and Chau 2001; Thong 1999).

Later research has sought to combine and rearrange well established theories in novel fashions (Quaddus and Hofmeyer 2007; Riemenschneider et al. 2003), to extend these models by adding factors which had been under-theorized in prior studies, such as

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[3] I state that perceived relative advantage has been reinterpreted in IT adoption research, because originally Rogers (2003) conceived the possibility that the relative superiority of an innovation was not only manifested in economic terms, but also in other terms, such as social status. In the IS field the dominant interpretation coincides with Iacovou's et al. (1995) conceptualization of perceived benefits, which is purely instrumental.

business competences and capabilities from the resource-based view of the firm (Caldeira and Ward 2003), perceived social risks of IT adoption (MacKay et al. 2004), business strategic orientation (Wang and Ahmed 2009), and risk propensity (Li et al. 2011), or to contextualize and flesh out key theoretical constructs so as to be more closely connected with specific technologies such as the Internet (Mehrtens et al. 2001), e-commerce (Grandon and Pearson 2004) or open source software (Macredie and Mijinyawa 2011). In this sense, the small business IT adoption research subset mirrors trends found in the broader set of organizational IT adoption research: viewed individually, each of these studies has enhanced our understanding of the many nuances around IT adoption and has incrementally improved our predictive capabilities. Viewed together, they have formed a pattern that is indicative of a competency trap (Levitt and March 1988), whereby the field has continued to use a research mould which is known to work, but which is yielding diminishing marginal returns and hindering our collective ability to break new grounds (Fichman 2004).

Responsive to these observations, recent studies have started to explore new research avenues by bringing to the table fresh theoretical approaches, such as protection motivation theory to understand how small businesses perceive malware threats and cope with them (Lee and Larsen 2009), contingency theory to view how local demand and service characteristics impinge upon adoption decisions made by small health care providers (Baird et al. 2012), and absorptive capacity to disentangle the ways in which small software companies combine their knowledge base and information-seeking routines to innovate (Carlo et al. 2012). Also importantly, other studies have begun to broaden up the research agenda by studying environmental actors deliberately involved in

e-commerce adoption, such as government agencies or trade associations, rather than adopters themselves. These studies have started from the observation that e-commerce uptake by small businesses is uneven and usually concentrated in low-complexity applications, such as e-mail and web browsing; hence, they have investigated the reasons behind the success or failure of initiatives at the meso or macro levels to move small businesses further up the e-commerce ladder. It has been found that one-to-many delivery models may help move small businesses higher up, and that to build a critical mass which makes these delivery models viable, such models depend on trusted intermediaries (Brown and Lockett 2004; Gengatharen and Standing 2005). Further, it has been noted that some of these initiatives have internal deficiencies manifested throughout their planning, execution and evaluation which limit their ability to respond to the needs of small business (Vega et al. 2008).

Finally, a few dissenting voices have claimed that the uneven uptake of IT by small businesses tells us less about the inadequacies of small businesses as innovators, and more about the inadequacies of our research models to genuinely understand small businesses. In particular, predominant models fail to consider IT abandonment as a sensible course of action, do not account for precarious or severely resource-constrained business contexts where investing time or money in IT may constitute a diversion from more effective uses of resources, and make little room from situated individual reflexivity – beyond the assumption of economic rationality – (Dobson et al. 2013; Harwood 2011; Molla et al. 2006). The IT encountering perspective I put forward in this dissertation joins these emerging voices.

2.1.3 The First Blind Spot

Throughout this section, I have begun to discuss the idea that most studies on organizational IT adoption, by making use of a remarkably similar underlying work template, have incrementally contributed to knowledge and research practice, but have also introduced unnecessary rigidity into how this research is conducted, and have unintendedly diminished our collective ability to do research in other ways and break new grounds. Here, I will discuss this idea in more detail.

This underlying work template prompts the researcher to start their study by choosing a focal IT, broadly or narrowly defined (e.g., e-commerce, open source, the Internet, etc.), and then to continue on by elucidating the factors that best predict the adoption of this focal technology among the population of interest. I claim no exclusivity rights to the latter and most conspicuous dimension of this general observation, and recognize that for about a decade IS researchers have stated, in one way or another, that variance approaches (Mohr 1982) have been predominant in IT adoption research (Fichman 2004; Jeyaraj et al. 2006; Venkatesh 2006; Williams et al. 2009). I do, nonetheless, argue that the former and more subtle dimension of this observation has been generally missed by commentators. That is, most research efforts studying this time period at small businesses assume from the start the saliency and significance of a focal IT which will, hopefully, enter the business, and do not pay attention to how such IT becomes noticeable or worthy of consideration in the first place.

To substantiate this claim, Table 1 lists the articles on small business IT adoption that I reviewed, specifying which IT they focus on and how that IT is defined or operationalized to participants. Table 1 allows us to see that all these studies start from a

focal technology which is defined in some way, and around which data collection is
centred. What is important to note here is that these studies do not encourage data
collection efforts to move away from that focal technology.

Table 1: Summary view of studies on adoption by small businesses

Study	Focal IT	Definition or Operationalization of Focal IT
Raymond, 1985	Any IT equating to the firm "being computerized".	"Being computerized" meant using IT applications in the areas of accounting, budgeting, sales, inventory, purchasing, production, human resources or word processing.
Delone, 1988	Computers	Participants included businesses that had been using computers for over three months.
Cragg & King, 1993	Business applications	The researchers' interest was in IS growth, which was operationalized as number of new applications in the observed time period. Included applications covered areas such as accounting, budgeting, design, inventory, payroll, and word processing.
Iacovou, et al., 1995	Electronic data interchange (EDI)	The study focused on a single EDI instance made available by a local government.
Harrison, et al., 1997	Any IT serving "competitive purposes" (p.172)	In the survey participants were requested to mention a technology that would best help them compete, and then asked to base their answers on that technology.
Poon & Swatman, 1999	Internet commerce	Definition includes: sharing of business information, maintaining business relationships, and conducting business transactions by means of Internet-based technology.
Thong 1999	Any IT equating to the firm "being computerized".	"Being computerized" was operationalized by the researchers by asking participants whether any of the following applications was used in their company: accounting, inventory control, sales, purchasing, human resources, computer assisted design, EDI, manufacturing or other (specified by participant).
Kendall, et al., 2001	e-commerce	Survey questions utilized two approaches to refer to e-commerce: - In items associated with independent variables, the term "doing business over the Internet" was used. - For the dependent variable, specific instances of e-commerce were mentioned. These were: website, online sales and online purchasing.
Kuan & Chau, 2001	EDI	The researchers selected a single EDI instance, called ValuNet.
Mehrtens, et al., 2001	Internet	The Internet was broken down into three components: email, Internet browsing, and website. Participants were asked questions about their adoption or non-adoption of these components.

Study	Focal IT	Definition or Operationalization of Focal IT
Caldeira & Ward, 2002	IT applications used in manufacturing	The researchers' interest was in increasing IT adoption, which was operationalized as moving along four rungs: - Administrative systems - Applications supporting core manufacturing processes - Applications integrating core processes - Applications enabling external integration
Caldeira & Ward, 2003		
Riemenschneider, et al., 2003	"Any type of web presence" (p. 270)	The term web presence was used in the survey questionnaire. There is no explicit mention in the paper about whether the term was defined to participants, and if so how.
Brown & Lockett, 2004	Critical e-applications	Defined as an "e-business application, promoted by a trusted third party, which engages a significant number of SMEs by addressing an important shared business concern within an aggregation" (p. 21). Based on theoretical considerations, the researchers located specific sites and applications to be studied.
Grandon & Pearson, 2004	e-commerce	e-commerce is defined as the process of buying and selling products or services using electronic data transmission via the Internet. Examples outside this definition are specifically provided. They include electronic publishing to promote marketing, advertising, and customer support, email, and websites.
MacKay, et al., 2004	e-commerce	e-commerce is defined as "the establishment of a company website to share information, maintain relationships and conduct transactions using electronic networks". Questions refer to websites more generally.
Gengatharen & Standing, 2005	Regional e-marketplaces	Six existing regional e-marketplaces were identified and studied. Interactions with participants were related to those specific initiatives.
Molla, et al., 2006	e-commerce	The e-commerce site of a single organization was followed over a period of time.
Quaddus & Hofmeyer, 2007	B2B trading exchanges	A single initiative called Western Australia Government Electronic Marketplace (WA GEM) was studied.
Vega, et al., 2008	e-business	A single e-marketplace platform for the building supply industry was studied.
Lee & Larsen, 2009	Anti-malware software	Participants were given descriptions of malware, malware attacks, and anti-malware software.
Wang & Ahmed, 2009	e-commerce	Measured by asking participating firms to specify the percentage of total sales revenues generated via e-commerce in the last year.
Hardwood, 2011	Online technologies	Interviews touched upon technologies such as websites, online intermediary services for promoting the business, and online booking services. The analysis in the paper focuses on online bookings.
Li, et al., 2011	Online Direct Sales Channels	Defined to participants as Internet-based sales channel established by an organization to sell its products or services directly to its customers. The definition explicitly excluded web platforms involving other organizations as resellers or facilitators (e.g., Amazon, eBay), while accepting the involvement of a third party for functions such as payment and shipping.

Study	Focal IT	Definition or Operationalization of Focal IT
Macredie & Mijinyawa, 2011	Open source software	Observed products included workstation operating systems, server operating systems, database management systems, email clients, Internet browsers, office software and other applications (listed in p. 241).
Baird, et al., 2012	Patient-Facing Web Portals	Operationalized as the presence of at least one of the following three patient-centric functions: online disease management, patient-provider email or messaging, or personal health record.
Carlo, et al., 2012	Internet-based radical innovations	Based on a literature review and a pilot study with industry experts, the researchers identified a list of 32 instances of innovations which were in agreement with their theoretical definitions of radical innovation.
Dobson, et al., 2013	Broadband	A single organization which had adopted broadband and had started to develop a social media application was followed over a period of time.

Predefining a focal IT within the research design makes sense if we want to centre our understanding around that specific IT. But it is a problem if we want to grasp the views and lived experiences of individuals – small business decision makers in this case – because it negates, or at least hinders, the possibility of exploring situations in which other, IT and non-IT, stimuli and responses are involved. Put differently, it narrows our focus of investigation to our own preferred technologies, and precludes us from seeing outside and beyond them. Therefore, as regularly conducted, research about organizational IT adoption has eclipsed the study of other aspects of the period before IT enters the organization that do not fit nicely into its dominant framework. The one aspect that motivates this research, which I have mentioned earlier, is the lack of attention to how and why some IT becomes salient or worthy of consideration to a business decision maker, and how different ways and rationales for noticing IT may affect the decision making process that follows.

To grasp the meaning I intend to convey by sharing this observation, let us assume that a piece of IT, whichever one we want to think about, is not yet salient or worthy of

consideration by a small business owner. That is, let us put ourselves in the shoes of the owner who either has not heard about that focal IT yet or has not had any reason to consider it as a possibility for their business. The first question one might want to ask is: how or why does this IT get noticed? Arguably, a situation of some sort must happen to the business or its owner that puts this piece of IT within the owner's span of attention, and even then such IT might be competing against other potentially sensible responses to the situation, from doing nothing, to doing something other than IT, to doing something including other IT. Further questions might thus be: how do business owners respond to noticing IT, and how are such responses related to the way in which IT gets noticed? The IT adoption literature, as it stands, has limited answers to these important questions.

2.2 The IT Selection and Evaluation Literature

In this thesis I define the literature on IT selection and evaluation, or IT procurement, as the collection of research studying *ex-ante* assessments of *competing IT alternatives* aiming to address the same organizational issue. Appendix B provides further details about my rationale and procedures for locating and selecting the studies to be included in this literature review. In the review and the discussion of findings that follows, I do not make a distinction between a 'broader' and a 'small business' IT procurement literature, but consider it as a whole. This is because, in contrast to the IT adoption literature, there is no discernable pattern suggesting that such a distinction has been pursued by researchers, and also because my search identified a very small number of IT procurement studies that use small businesses as their empirical context.

The literature on IT selection and evaluation follows broader trends in the IS field, with a historically dominant group of scholarly work implicitly adhering to a rationalistic view

of decision making (e.g., Ahituv 1980; Keil and Tiwana 2006; Klein and Beck 1987) and a smaller but increasingly important stream of research adhering to what one may call a socially embedded view of decision making (Howcroft and Light 2006; Howcroft and Light 2010; Tingling and Parent 2004). Whereas the former has been concerned mostly with identifying technical criteria and tools that are used or should be used for the selection and evaluation of IT alternatives, the latter has striven to advance a richer picture of IT procurement by highlighting the crucial role played by social and non-technical aspects in this process.

Those two different views have influenced the theoretical underpinnings and methodological choices of this literature to a large extent. They also help explain what we know and do not know about IT selection and evaluation. In particular, I argue that despite all the knowledge that has been gained, neither the rational nor the socially embedded view of IT procurement shed enough light on the issue of how decision makers come to determine plausible courses of action in the first place, which are indisputably a central input to actual choice. Below, I discuss these issues in more detail.

2.2.1 The Rational View

Early work on IT procurement invested substantial effort in suggesting structured methodological tools which could assist decision makers in choosing an alternative from a predefined pool. Over time, these tools have grown to remarkable levels of sophistication, partly to address the insufficiencies of their predecessors regarding the limits of human rationality and the ill-structured nature of IT evaluation problems. Indeed, the field has gone from the application of evaluation methods based on discounted cash flow, weighted rankings and choice modeling techniques (Ahituv 1980;

Anderson 1990; Klein and Beck 1987), to the critique of these methods (see Powell 1992 for a review of major criticisms), to the subsequent advocacy and application of more refined approaches for the modeling and evaluation of IT alternatives, such as risk-oriented methods (Lewis 1999), the analytic hierarchy process technique (Lai et al. 1999), real options (Taudes et al. 2000), or misfit analysis based on the task-technology fit theory (Wu et al. 2007).

In addition to evaluation tools, this stream of research has also focused on aspects relating to the process and criteria pertaining to IT selection and evaluation. Regarding the selection process, several systematic, step-wise approaches have been recommended for navigating through the unstructured decision problem of selecting the best alternative (Meador and Mezger 1984) while minimizing the costs and efforts associated with selecting an alternative (Wybo et al. 2009).

The investigation of criteria used by decision makers for selecting among various IT instances has considered a wide variety of contextual elements, such as small organizational size (Chang et al. 2012; Chau 1994; Chau 1995), the nature of different IT products (Rincon et al. 2005; Tam and Hui 2001), packaged software (Keil and Tiwana 2006; Montazemi et al. 1996), deployment method (Benlian 2011)(Benlian 2011) or licensing method (Benlian and Hess 2011). Key evaluation criteria identified by this set of the literature include product functionality, product quality and variety, product reputation, client base, cost, ease of use, ease of customization, ease of implementation, and vendor reputation and service capabilities, the latter including training and support (Benlian 2011; Benlian and Hess 2011; Chang et al. 2012; Chau 1995; Keil and Tiwana 2006; Montazemi et al. 1996; Rincon et al. 2005; Tam and Hui 2001).

2.2.2 The Socially-Embedded View

Despite the sophistication of evaluation tools and the greater appreciation gained about evaluation criteria, this knowledge is still greatly dependent on refined rational choice assumptions, and it is mostly on these grounds that it has been questioned by alternative views. In response to increasingly complex methodological tools for evaluation, research in this stream has found that some organizations do not use any systematic evaluation tools at all (Kunda and Brooks 2000), and that even those organizations that do tend not to go beyond weighted rankings, partly because people involved in IT procurement decisions believe these tools fail to capture criteria that are hard to measure and evaluate, and yet do matter, such as vendors being proactive, responsible, or quality-minded (Michell and Fitzgerald 1997).

Moreover, this literature has enriched our understanding of the background process whereby IT choices are made, over and above the criteria and methods employed for carrying out the formal evaluation. Empirical evidence suggests that approaches used by organizations to engage with the IT procurement process range from planning-driven to opportunistic (Huff and Munro 1985; Proudlock et al. 1998), with the latter being perhaps predominant in practice (Huff and Munro 1985; Kunda and Brooks 2000) and likened to the received imagery of a garbage can model of decision making where the "coming together of technology and issue has a more serendipitous flavour to it" (Huff and Munro 1985 p. 332).

These studies identify two other central characteristics of the process. First, it regularly involves experimentation, or trialing, (Huff and Munro 1985; Kunda and Brooks 2000) as a means to assess the properties of the technologies subject to evaluation. Second,

regardless of its formal or informal conduct, these studies sustain that the process is inherently social in nature, and as such cannot be studied in ways that abstract out the social context.

Three social dimensions that have attracted most of the attention of researchers are institutional isomorphism, divergent interpretations of IT attributes, and politics. Research has revealed that, in making IT choices among uncertain competing alternatives, decision makers will generally tend to select the alternative that their peers in other organizations choose (Tingling and Parent 2002), a finding largely consistent with the legitimacy arguments proposed by neo-institutional theory (DiMaggio and Powell 1983) and fad and fashions research (Abrahamson 1991). It has also been argued that, despite the apparent rationality of formal evaluation methods, power and politics run deep through the process and the content of IT evaluation. To put it somewhat figuratively, power relationships determine which criteria and weights are used in an evaluation matrix. This is because the multiple social actors participating in IT procurement come to the process with different interests and understandings about the various IT products under evaluation, as well as with distinct, yet changeable, power positions, which they bring to bear on the evaluation process so as to affect its outcomes (Howcroft and Light 2006; Howcroft and Light 2010; McGovern and Hicks 2004). Consistent with this socially embedded view, new prescriptions about the selection and evaluation process have been formulated that seek to be context-aware rather than IT-centric (Lundell and Lings 2003).

The pivotal role played by social dynamics, namely legitimacy and power, in IT procurement might explain the apparent chasm between the rational view and the

socially-embedded view, with the former largely overlooking social aspects as if they did not matter, and the latter stressing them as if nothing else mattered that much– i.e., suggesting that formal tools may only serve a ritualistic or ancillary function –. In the last decade, however, reconciling views have started to emerge inviting us to rethink this chasm. Tingling and Parent (2004) claim that the rational and the ritualistic aspects of IT procurement are in tension but not in conflict, and that they complement each other in the real world. Pollock and Williams (2007) sustain that methodological evaluation tools play an extremely valuable role in practice, inasmuch as they assist social actors in the process of rendering IT attributes of various alternatives knowable and comparable. In other words, as far as IT properties are socially constructed, formal evaluation tools (e.g., criteria and matrices), by means of allowing the definition, assessment and communication of IT properties, are a vehicle for enabling such social construction process.

2.2.3 The Second Blind Spot

Despite the richness of the literature on IT procurement, I argue that both the rational and the socially-embedded streams of literature have been mostly concerned with explaining the portion of the process that goes from having a pool of known alternatives to choosing one, and have largely neglected another important portion of the process: the one that goes from receiving some internal or external stimulus suggesting IT, to defining a set of plausible courses of action as potential responses.

In Table 2, I summarize how the reviewed articles on IT procurement have addressed the issue of defining alternatives. As the table indicates, with only few exceptions, researchers assume alternatives as known by decision makers or do not include

alternative identification as an area of study. They either do not deal with specific alternatives in their studies, fail to report how alternatives were identified in their empirical work, embed a predefined set of alternatives in their research design, or arrive at research sites after alternatives have been defined and thus have limited information to report.

Table 2: Summary view of studies on IT selection and evaluation

Study	Topic of study	Details about definition of alternatives
Ahituv, 1980	- Evaluation criteria - Evaluation tools	Various providers were contacted, but there is no mention about how they were identified.
Meador & Mezger, 1984	- Evaluation criteria - Evaluation process	Not reported. Alternatives were not addressed by the study.
Huff & Munro, 1985	- Evaluation process	The study captured some data and discussed some themes concerning how participant organizations gathered information leading to the identification of suitable alternatives.
Klein & Beck, 1987	- Evaluation tools	Alternatives were assumed as known in order to investigate the evaluation technique.
Anderson, 1990	- Evaluation tools	Alternatives were assumed as known. It is explained that this is an explicit requirement for working with the methodological tool presented in the paper.
Chau, 1994	- Factors affecting evaluation	Not reported. Alternatives were not addressed by the study.
Chau, 1995	- Factors affecting evaluation	Not reported. Alternatives were not addressed by the study.
Montazemi, et al., 1996	- Factors affecting evaluation	Alternatives were predefined in the experimental design. 30 actual software packages were included.
Michell & Fitzgerald, 1997	- Evaluation criteria - Evaluation tools - Evaluation process	The study captured some data and touched upon some themes concerning how outsourcing clients searched for and shortlisted alternatives to be evaluated.
Proudlock, et al., 1998	- Evaluation process	There are some brief mentions of how studied organizations gathered information leading to the identification of suitable alternatives.
Lai, et al., 1999	- Evaluation tools	Alternatives were known at the time the case study began.
Lewis, 1999	- Evaluation tools	Not reported. Alternatives were not addressed by the study.
Kunda & Brooks, 2000	- Evaluation criteria - Evaluation tools - Evaluation process	The study captured some data and briefly touched upon some themes concerning how participant organizations searched for software alternatives to be evaluated.
Taudes, et al., 2000	- Evaluation tools	Alternatives were known at the time the case study

Study	Topic of study	Details about definition of alternatives
		began.
Tam & Hui, 2001	- Evaluation criteria	An IDC dataset was used which contained data from a set of vendors. This set was used as the pool of alternatives.
Tingling & Parent, 2002	- Factors affecting evaluation	Alternatives were predefined in the experimental design, in the form of 2 hypothetical plug-ins to be added to an Internet browser.
Lundell & Lings, 2003	- Evaluation tools	Not reported. Alternatives were not addressed by the study.
McGovern & Hicks, 2004	- Evaluation process	Alternatives were identified during the course of the study, and the process for searching and shortlisting is discussed in the paper.
Tingling & Parent, 2004	- Evaluation process	2 alternatives had already been identified at the research site before fieldwork began and the paper briefly reports on the history leading to them. This is, however, not the main focus of the study.
Rincon, et al., 2005	- Evaluation criteria - Evaluation tools	During the course of the study, 44 alternatives were identified in a survey published by an important professional magazine. It was assumed that they constituted the universe of alternatives, and the demonstration of the tool was based on this list.
Keil & Tiwana, 2006	- Evaluation criteria	Alternatives were predefined in the design, in the form of 8 hypothetical ERP software packages.
Howcroft & Light, 2006	- Evaluation process	4 alternatives were identified at the research site and the paper briefly reports on the history leading to them. This is, however, not the main focus of the study.
Howcroft & Light, 2010	- Evaluation process	
Pollock & Williams, 2007	- Evaluation criteria - Evaluation tools - Evaluation process	3 alternatives were identified at the research site and the paper briefly reports on the history leading to them. This is, however, not the main focus of the paper.
Wu, et al., 2007	- Evaluation tools	Not reported. Only the alternative chosen at the research site is mentioned and used to illustrate the evaluation tool proposed.
Wybo, et al., 2009	- Evaluation tools	Alternatives were assumed as known in order to investigate the evaluation technique.
Benlian, 2011	- Evaluation criteria	Alternatives were predefined in the research design, in the form of 3 hypothetical packages: a closed-source on-premise, an open-source on-premise, and a closed-source on-demand.
Benlian & Hess, 2011	- Evaluation criteria	Alternatives were predefined in the research design, in the form of 4 hypothetical packages: 1 open source office suite, 1 open source ERP, 1 proprietary office suite, and 1 proprietary ERP.
Chang, et al., 2012	- Evaluation criteria - Evaluation tools	Not reported. Alternatives were not addressed by the study.

The portion of the process that has been overlooked is not insignificant. Herbert Simon and his colleagues (Simon et al. 1987 p. 11) refer to this portion as problem solving, and define it as "work of choosing issues that require attention, setting goals, finding and designing courses of action", while distinguishing from decision making, which they understand as the activities related to "evaluating and choosing among alternative actions". By assuming alternatives as known – or otherwise overlooking the process leading to a pool of alternatives – and carrying out empirical research in the way they have done it, these works leave a substantial part of the actual process unattended. Namely, very little is known about the early stages of IT procurement, when decision makers develop plausible courses of action to be evaluated later in the process. If we again imagine an individual, a small business owner in this research, who is being prompted to make changes to their current IT, some questions arise: How do they match incoming cues with potential courses of action? How do they construct plausible alternatives to address their concerns and what do these alternatives look like? Do they try to navigate the complex and dynamic IT marketplace described in the introduction? How is the ensuing decision making process affected?

The few articles I identified that provide some answers to these questions, generally present search processes even in large organizations as ad-hoc, informal and limited in scope, tell us that systematic scanning routines are easily postponed by short-term pressures, and notice that decision makers do not seem very knowledgeable about the IT marketplace (Huff and Munro 1985; Kunda and Brooks 2000; Michell and Fitzgerald 1997; Proudlock et al. 1998).

It is apparent that more research, beyond the usual confines of the IT adoption and the IT procurement literatures, is needed. But before I move to discuss the kind of research approach I see as suitable and followed in this research, I will first review some of the origins and conceptual consequences of these blind spots.

2.3 Tracing the Origins of Blind Spots

There are several potential explanations of why the IS field has largely missed the processes whereby small business owners come to notice or consider IT, and arrive at suitable courses of action. They include historical evolution of IT in organizations, trends of knowledge production in the field, and methodological difficulties.

First of all, both the evolution of IT in organizations and the scholarly efforts in our field to keep abreast of this evolution partly account for the blind spots. In the very early days of organizational computing, computer-based technologies were expensive and knowledge about them was scarce. These features had distinctive consequences not only for how IT was rolled out in practice, but also for how academia approached these emergent realities. At the practice side, high costs made IT innovation a privilege of the few, mostly very large organizations that could afford technological innovation. Similarly, there was no such thing as IT marketplaces for products, services or jobs, or at least not in the way we know them to exist today. This meant that most IT innovation initiatives started as in-house systems development projects (Markus 1999). In these organizations, as well as in accompanying academic research, awareness of the technology to be adopted could be safely presupposed or achieved, and IT adoption at the individual level was largely constituted as the problem of ensuring that targeted employees would use a newly built IT system.

Over time, the market for IT innovations increased, the IT industry grew, and exciting

opportunities emerged for organizations to get IT products and services from the

marketplace. Software could be bought and used as is, or bought and customized.

Ambitious software innovations, such as CASE tools, decision support systems,

executive systems, enterprise resource planning (ERP), or customer relationship

management (CRM), gradually became available as software packages. Researchers then

set off to study the adoption of these promising innovations. In designing their samples,

they were careful to select respondents who would be involved in purchase decisions.

Again, awareness of the innovation was a fair assumption to hold. When the focal IT was

a software development tool, IT managers were surveyed, and they would presumably be

cognizant of technology advances relevant to their work. When the focal IT was a

business application (e.g., ERP, CRM), the momentum sustained by technology vendors

and the media (Wang and Swanson 2008) increased the chances that the technology was

salient to surveyed business managers. Similarly, IT outsourcing became feasible and

popular (Lacity and Hirschheim 1993). Outsourcing, nonetheless, was generally viewed

as the domain of large companies which needed to find a way to cut down IT costs, while

rebalancing the amount and nature of the IT work being done in-house (Loh and

Venkatraman 1992). Therefore, most research remained within the confines of large

organizations, where internal IT expertise and resources usually exist, and thus the

recognition of IT-related needs and the identification of relevant IT alternatives continued

to be ignored or viewed as relatively minor concerns.

Consequently, IT adoption at the organizational level was constituted around the problem

of understanding the factors that drive IT uptake in organizations, and not around issues

concerning attention, search, or choice, even though the industry trends mentioned earlier suggested that those issues were becoming increasingly important management problems.

Further changes in the IT marketplace have included end-user computing, more packaged software, open source licensing, cloud-based software delivery, and mobility, among many others. Researchers have witnessed, explored and come to understand remarkably well all these trends. Being familiar with the ever-evolving IT landscape, IS scholars can easily notice IT, or changes in IT, and can readily come up with distinct IT alternatives when designing a new study, without needing to look for them. The problem, though, is that most ordinary people are not seasoned IT explorers. Small business owners, who are my empirical setting, are ordinary people who may come to notice IT and IT changes differently, and who might struggle to identify suitable courses of action in this convoluted marketplace. Interestingly, complexity of the IT marketplace is so great that similar observations have been made since the early 1980s and even in the context of large businesses (Huff and Munro 1985; Michell and Fitzgerald 1997).

A specific aspect of the usual path towards knowledge creation about decision making in the social and behavioural sciences at large, and IS specifically, has also been implicated in the current state of affairs, and I present it as a second reason for the blind spots. Early research about business decision making usually held a fairly rationalistic view of decision making processes, whereas later research has reacted to what is seen as excessive rationalism or instrumentality, thereby striving towards portraying a more socially embedded view of decision making. This trend is visible in most IS research concerned with decision making (Avgerou 2000), and has already been noted about research on IT adoption and diffusion (Fichman 2004; Harwood 2011; Swanson and

Ramiller 1997) and on IT procurement (Howcroft and Light 2006; Pollock and Williams 2007; Tingling and Parent 2002). Through this reactive mode of operation, socially-embedded approaches have successfully attained a deeper, more nuanced understanding of studied phenomena, but they have done so at the expense of breadth. Put more precisely, in the context of IT adoption and IT procurement socially-embedded approaches have reacted against rationalistic approaches by pointing at the limited usefulness of seeing IT choices as purely rational, but have failed to notice how much there is for us to study beyond choice itself. Getting to the point where a choice among competing courses of action can be made is a central portion of the problem that deserves serious examination.

A third reason for the blind spots is associated with methodological difficulties for capturing the early stages of the process in a timely manner. Pollock and Williams (2007) note that IT procurement is infrequent, its early stages can be short and ad-hoc, and by the time researchers gain access to a research site some of these early moments will already have passed. Therefore, field researchers are likely to start their investigations after some cues have led decision makers to see IT as a potential response to a situation facing the business, and after some courses of action have already been defined.

2.4 Assessing the Implications of Blind Spots

Current conceptualizations of what happens before a certain piece of IT arrives at a small business put forward by the literature on IT choice suffer from some serious inadequacies which can be partly attributed to the aforementioned blind spots. I will discuss three particularly relevant conceptual weaknesses: the pro-innovation bias, the notable absence

of search from existing theories of IT choice, and the unexplained gaps between competing explanations of IT choice.

First, earlier research on IT adoption in particular has proceeded from IT towards the business. An underlying side effect of this directionality has been that non-adoption responses are deemed undesirable, and non-adopters are denounced as laggards. Rogers describes this feature of research as the pro-innovation bias, and states that this is a problem 'in an intellectual sense' (2003, p. 107), because it leads researchers to understudy certain aspects of diffusion processes, such as lack of awareness, rejection, or discontinuance, and thus results in a failure to understand diffusion more fully. Fichman (2004) adds that the pro-innovation bias also makes it harder for researchers to recognize differences in quality across various innovations.

If one inverts this directionality and goes from the business towards IT, one might find that adoption does not always constitute a sensible response to IT-related stimuli. Indeed, decision makers themselves may not gauge how appropriate a response is on the basis of whether or not IT is adopted, how much of it, or how fast, but on the basis of how well this response, with or without novel IT, appears to make sense for the individual (Harwood 2011; Swanson and Ramiller 2004; Weick 1979). The pro-innovation bias, or in other words the disciplinary tendency to believe that adoption responses are the right responses, is the reason why I argue that previous research has been more responsive to the needs of the entrepreneurial communities diffusing IT innovations than to the needs of organizations, small businesses in particular. While the former benefits from IT diffusion almost certainly, the latter might have good reasons to respond to IT-related stimuli in ways other than IT. I further sustain that until the directionality of research is

inverted so as to start from the business and not from IT, our conceptualizations will be hampered and will remain inadequate to meet the needs of potential adopters.

Second, search is conspicuously absent from our conceptualizations of the processes leading to IT choice. As discussed earlier, search of IT alternatives has been touched upon only in a few IS studies, but has not been the core focus of any of them, let alone specifically theorized upon. The fact that historically there were relatively few alternatives to choose from helps explain why search, or put more broadly, the identification of suitable courses of action, was largely left out of theories of IT choice. But the IT marketplace has come a long way since those early days, and diversity of alternatives lies at the core of it today. Indeed, several researchers have started to shed light into the nature and industry effects of specific portions of this diversity, such as the shift to services and cloud-based deployment models (Cusumano 2008; Cusumano 2010), the variety of licensing types (Economides and Katsamakas 2006; Sen 2007), the fragmented and crowded state of some market segments, such as enterprise systems (Chellappa et al. 2010; Fink and Markovich 2008), and the globalization of IT provision (Arora and Forman 2007; Gefen and Carmel 2008). The complexity and dynamism of the IT marketplace create a paradox for organizations: while these characteristics might open up new opportunities for organizations around technology, they might also result in situations where suitable alternatives are not known ex-ante to decision makers. This paradox is further aggravated in resource-constrained organizations, with pressing needs and fewer time, money and knowledge resources. We thus lack theoretical explanations as to how organizations search for appropriate IT needles in the IT marketplace haystack,

if at all. Without a solid understanding of search, we are severely underestimating the span and complexity of IT choice phenomena.

I now come to the third way in which current conceptualizations are insufficient. Several competing accounts exist of the rationale behind IT choice, all of them duly accompanied by empirical support, from seeing individuals as rational decision makers adopting or selecting IT alternatives on the basis of expected instrumental gains, to portraying individuals as making such choices mostly on the basis of social considerations, such as legitimacy pressures or organizational politics. Explanations regarding why or how such disparate explanations coexist are rather limited. The argument suggesting that early adopters make choices based on instrumental rationality, whereas the choices of late adopters are driven by institutional legitimacy has been called into question, mainly because it downplays the institutional work carried out by various interested parties from the beginning of the innovation's diffusion journey (Swanson and Ramiller 1997), and fails to explain the choices occurring "in the middle" between early and late adopters (Wang 2010). Further, with few notable exceptions (Jeyaraj and Sabherwal 2008; Pollock and Williams 2007; Tingling and Parent 2004), the coexistence of such starkly different logics in the real world has not been a specific area of concern for IT choice research, and the gap between rational and socially-embedded views does nothing to help us move our understanding beyond its current state. This situation seems somewhat similar to the one Stephen Barley might have found himself in about 30 years ago, when he encountered drastically opposing views about the relationship between technology and structure, and very little progress in the way of theoretically reconciling these views. He concluded that a new perspective was needed:

Rather than continue to scrutinize research (...), a more fruitful plot may be simply to embrace the contradictory evidence as a replicated finding. One could then seek alternate theoretical frameworks that would explain technology's link to structure while treating inconsistent outcomes as a matter of course (Barley 1986 p. 78)

Similarly, I think that the field has now enough accumulated evidence suggesting that both instrumental rationality and social embeddedness have important roles to play in the process leading to IT choice, and that more research efforts aiming at bridging the gap between these two perspectives are needed if we are to continue advancing our knowledge.

Actions can be taken to fill this gap, increase our understanding of the search processes preceding IT innovation, and correct the innovation bias. The result will be stronger theory. Actions must include the development of theoretical foundations that address the blind spots head-on, and the crafting of empirical strategies that explore what is actually happening at organizations as they notice IT, interpret it as relevant, and develop suitable courses of action to adopt a specific instance, in whichever order that might happen or fail to happen.

At this point, a clarification is in order. I do not intend to argue that IS researchers do not have any theoretical tools to explain how attention, interpretation and responses to IT take place. What I suggest, however, is that extant works are scarce, scattered across several places, have not built a distinguishable domain of enquiry, but have fused into more recognizable domains of enquiry (i.e., IT adoption, diffusion of IT innovations, IT selection and evaluation), and have not looked at these specific aspects of the phenomenon in a sufficiently distinctive way.

There is no single path to undertake the actions that are needed to produce stronger theory. The name I gave to the path that I followed is IT encountering. IT encountering can provide an overarching framework within which more research efforts connected to this area can gather together. In the next three chapters, I introduce this path. Chapter Three presents the theoretical foundations used to build this perspective, Chapter Four offers a conceptualization of small businesses that serves the purpose of developing situated theory on IT encountering, and Chapter Five explains the empirical strategy I considered suitable to the task. The results of following this path (i.e., the study findings), are presented in Chapter Six.

Chapter 3   Theoretical Foundations

This chapter defines IT encounters and presents the theoretical foundations I used to form

a basic understanding of the three sub-processes contained within an IT encounter:

interpretation, attention and responses. These three sub-processes, as theoretically

described in this chapter, were used to inform data analysis (i.e., they were used in the

coding process as categories) and they were preserved, with some adjustments, in the

process model of IT encountering that contains the study findings.

I define an IT encounter as any situation whereby a decision maker pays attention to cues

leading them to notice or consider the possibility of adding a certain piece of new IT to

their business, interprets these cues, and then responds to them in a way which might or

might not include the acquisition of new IT. I see IT encounters as experiences

individuals are faced with in the course of their everyday activities, and thus I see each IT

encounter as an instantiation of a larger and ongoing repertoire of episodic experiences

through which, purposefully or not, these individuals create and update their knowledge

base, which then they use to inform responses to new IT encounters. Through an IT

encountering perspective, I seek to explore the dynamics of IT encounters as experienced

by small business owners.

As defined here, IT encountering encompasses three interrelated sub-processes, each of

which has been considerably studied in the scholarly literature outside the IS field:

attending to cues, interpreting those cues, and responding to them. Below, I elaborate on

these three processes, drawing on theoretical insights coming from – or building upon –

the Carnegie School (Cyert and March 1963; March and Simon 1958; Simon 1947), the literature on organizing and sensemaking (Weick 1979; Weick 1995) and the literature on mindfulness (Weick et al. 1999). In what follows, I present each sub-process in separate subsections, and within each subsection I introduce insights from these three literatures in blocks arranged sequentially, followed by a synthesis whereby the introduced ideas are used to explore the small business context. This presentation structure was conceived in the sole interest of clarity. I acknowledge that empirically these processes occur simultaneously and can be difficult to disentangle, conceptually there are some overlaps between them, and theoretically these three literature streams have informed one another considerably more than my exposition will reveal.

I also recognize that other theoretical perspectives, such as Kolb's experiential model of learning (1984) to name one, could fruitfully enrich our understanding of IT encountering. However, this research and the IT encountering perspective emerging from it are primarily shaped by the theoretical choices I have mentioned above.

3.1 Attention to Cues

Studying attention to environmental stimuli has a long history in cognitive psychology, sociology, and organizational studies (Emirbayer and Mische 1998; Ocasio 1997). It is generally believed that there is a gross disparity between the fairly limited amount of focal attention an individual can grant to stimuli, and the enormous volume of stimuli this individual could be exposed to at any given time. In particular, works close to the Carnegie School tradition have treated attention primarily as a cognitive resource, fringed by the same limits that bound rationality in general, and thus as a relatively scarce resource (Cyert and March 1963; Ocasio 1997). As such, individuals and organizations,

often spontaneously, economize on attention whenever possible by means of automatic processing and routinized behaviour (Cyert and March 1963; Nelson and Winter 1982). When attention does get used, it is used selectively – meaning that the individual or organization will attend to some aspects of the environment and leave others unattended, and will consider some responses and not others (Cyert and March 1963; March and Simon 1958; Ocasio 1997) – and sequentially, meaning that the individual or organization will attend to emerging situations and goals only one at the time (Cyert and March 1963; Greve 2008). The core idea that attention is a limited resource vis-à-vis the plethora of environmental stimuli, hence saved via routinized behaviour, is shared by the literatures on sensemaking (Weick 1995) and mindfulness (Weick et al. 1999).

If not all environmental cues will be attended to, the question that concerns us, as we try to understand why a small business owner will notice or consider IT for their business in the first place, is: which issues will tend to be attended distinctively, and not via routinized responses?

To this question, these theoretical approaches provide different answers. A main premise in the Carnegie School is that individuals in organizations will primarily attend to immediate problems, defined as situations where performance falls behind expectations – which they refer to as aspiration levels–, and thus these individuals will put out one fire after another (Cyert and March 1963). This view has been picked up and extended by more recent developments under the Carnegie School's umbrella, including the attention-based view of the firm (Ocasio 1997; Ocasio 2011), according to which attention is not only bottom-up (i.e., stimulus-driven) but also top-down (schema-driven), which implies

that individuals may attend not only to emerging issues but also to pre-existent frameworks informed by goals, task demands or identity (Ocasio 2011).

Recent work on attention has also suggested that attributes related to the individual or group providing the cues (i.e., their structural position and proactive work) are also important determinants of which issues receive attention (Bouquet and Birkinshaw 2008). This idea is closely related to familiar ideas also found in the IS literature, such as the psychological notion of subjective norm (Fishbein and Ajzen 1975), the notion of institutional isomorphism borrowed from organizational sociology (DiMaggio and Powell 1983), and the role of fashion setters in the IT fashions literature (Baskerville and Myers 2009), but here they are brought up in relation to attention behaviours specifically, as opposed to adoption behaviours.

From a sensemaking perspective (Weick 1995; Weick et al. 2005), individuals enact their environments (i.e., select portions of ecological change and pay attention to them) when i) there is a mismatch between the cues being encountered and the cause map used to make sense of these cues, and ii) this mismatch is severe enough so as to disrupt habitual work practices and force individuals into creating new meanings and updating their mental schemata through action (Weick 1993; Weick 1995). Thus, according to this perspective, it is the juxtaposition of ecological change and the individual's cause map which can trigger attention, as long as the individuals' sense that continuity is breached and normality has to be rebuilt (Weick et al. 2005). This explanation overlaps with the Carnegie School's view of performance feedback as an attention trigger, but it is more explicit in recognizing that sources of environmental cues are not limited to internal performance indicators. For example, an organizing vision, as propagated discourse about

an IT innovation, can be considered an exogenous IT-related cue which might breach continuity and be granted distinct attention (Swanson and Ramiller 1997), without necessarily be suggestive of performance falling behind aspiration levels.

A limitation in both perspectives is that they render a description whereby only issues that are constructed as sufficiently "salient" are attended to. If the cues are weak, the issue will tend to pass unnoticed. This description might ring true in many cases, but it is not generalizable across the board. A recent literature stream in organizational studies draws on the psychological notion of mindfulness (Langer 1989) with the specific goal of dealing with contexts in which weak cues do matter, because they could raise awareness of situations that could be harmful if left unattended (Levinthal and Rerup 2006; Weick and Sutcliffe 2006; Weick et al. 1999). I highlight three important insights that emerge from this literature, relating to the question of which issues will tend to be attended distinctively, and not via routinized responses. First, mindfulness, defined as a special state of "alertness and lively awareness", is required for an issue to be granted distinct attention when it is signaled by weak cues. During a mindful state, the actor is open to new information, embraces various perspectives to approach a situation, and is able to refine their mental schemata (Langer 1989, p. 138), thus it becomes possible for the actor to notice small signs and to interpret them as meaningful.

Second, mindfulness, being a state, is conditionally bounded. This implies that sustaining it for long periods is possible but demands deliberate efforts (Weick et al. 1999). The efforts towards mindfulness include, in a nutshell, activities that produce close and permanent, yet distributed and ad-hoc, vigilance to any details which, if known by one or more knowledgeable individuals, may be interpreted as early indications of problems

(Weick et al. 1999). Such efforts are considerably more costly than staying in the more ordinary, almost 'default' state of mindlessness, in which cognitive effort is saved via routinized responses (Langer 1989; Weick et al. 1999), and organizations might spontaneously balance the benefits and costs of both mindfulness and mindlessness (Levinthal and Rerup 2006; Swanson and Ramiller 2004).

Third, mindfulness is most often achieved by organizations where the costs of the outcomes resulting from not being mindful would be too great to bear (Weick et al. 1999). A notable example is high reliability organizations (HROs) (e.g., nuclear plants, air traffic control units), where costs of mindlessness are as high as human lives being lost. More generally, criticality of the outcomes should be measured against the expectations and goals of the organization itself, as well as the actors involved (Weick et al. 1999). To illustrate, Weick and his colleagues put forward the example of a manufacturing business: to the extent that in that context efficiency in production is a critical expectation, any problems threatening to halt the assembly line are pain points for the company, sources of serious distress for the foreman, and thus they are likely to be treated with some mindfulness. Indeed, there is evidence suggesting that when exceeding costs and personal relevance are present as decisional factors, decision processes tend to be more mindful (Fiol and O'Connor 2003).

The above discussion suggests that small business owners will only be able to grant limited attention to stimuli around them. To the extent that owners centralize decision making in them, there will be a large overlap between owners' attention and organizational attention. Because attentional processes consume human and organizational resources and capabilities, and these are limited in small businesses, it is

likely that a great amount of cues will slip below the business owner's radar and will not initiate change. Among the reasons why small business owners may pay distinct attention to IT cues, four non-mutually exclusive issues stand out as particularly relevant. First, small business owners are likely to notice cues suggesting a serious discontinuity in business activities (i.e., an immediate, burning problem) which a new IT product or service seems able to address. Second, educational and work backgrounds of small business owners, as constitutive elements of their cognitive frameworks, will be brought to bear and affect their attention to IT-related stimuli. Thus, business owners with IT-related education or work experience might be more predisposed towards noticing IT as a potential response to emergent business issues. Third, small business owners may pay attention to IT issued raised by actors important to them; in small businesses, these actors need not be individuals to whom the business is connected, they might also be owner's family members, friends and peers. Items in the list are non-mutually exclusive.

A last and more novel reason is derived from the mindfulness literature. Small businesses are organizations for which inattention can be overly costly, and where owners have personal high stakes in all situations impinging upon the business. Therefore, some mindfulness can be expected. Attention entails both noticing certain aspects of the environment suggesting IT changes and seeing suitable responses. Here, resource constraints characteristic of small businesses and ownership of those resources become crucial pieces of the puzzle. The environment might strongly indicate that resource-intensive changes are needed, but suitable responses might be those that economize on limited resources. Mindfulness in this context, as applied to attention, might be more about acknowledging conflicting cues and priorities than about noticing subtle cues. It

may entail not only noting environmental cues suggesting IT change, but also visualizing the internal business circumstances favourable and unfavourable to undertaking change. In this way, acknowledging resource limitations constitutes an important aspect of being a mindful small business owner.

3.2 Interpretation of Cues

IT encountering begins with attending to cues. Incoming cues require interpretation by the receiving actor so as to render a certain IT product or service as a more or less viable, desirable or required response to the situation at hand. The three theoretical perspectives have different but somewhat complementary views about what interpreting cues entails. The conventional Carnegie School's view portrays individuals as regularly monitoring their performance against their aspiration levels and trying to draw neat inferences as to whether they are performing within the range of their aspiration levels or below them (i.e., succeeding or failing) (Cyert and March 1963; Levitt and March 1988). Even though interpretation of experience is plagued with imperfections resulting from individual biases (Kahneman and Tversky 1979) and organizational politics (March 1962), the interpretation process will nonetheless try to disambiguate cues so as to produce a relatively neat outcome labelled as success or failure (Levitt and March 1988). Responses are based on the interpreted outcome, regardless of its quality, hence successes and failures will lead to different responses, which I will discuss in the following sub-section.

Within the selected literatures, the stream on organizing and sensemaking (Weick 1979; Weick 1995) is the one that provides the most detail about how interpretation happens. Indeed, its proponents argue that interpretation is the core phenomenon of interest in this

perspective (Weick et al. 2005). Interpretation runs through the entire organizing process under the further-reaching label of sensemaking. This literature suggests that all too often extracted cues lend themselves to many interpretations (i.e., cues are equivocal) (Weick 1979; Weick 1995), a tenet that challenges the proposition of discrete, binary encoding of experiences as successes or failures. During the organizing process meanings break down, are reconstructed and stored in ongoing cycles. Faced with disturbing and equivocal ecological changes, individuals engage in efforts at sensemaking whereby they bracket a portion of the stream of experience for further attention, retrieve knowledge stored in pre-existing cause maps to produce workable meanings with which to address the situation at hand, and act upon it. New meanings that are useful for reducing equivocality and hence cope with environmental change are selected for use. It is in this way that organizing is adaptive. Cause maps are cumulatively built upon experience and they simplify the situation so that meaningful aspects of it can be retained – i.e., stored and retrievable for future use–. Storage and retrieval are knowingly incomplete and fallible processes. As such, cause maps are far from perfect; consequently, interpretation both as a process and an outcome is driven by plausibility and not accuracy (Weick 1979; Weick 1995).

 This emerging picture of interpretation of cues can be enriched by adding insights from works which have particularly looked at the role that mindfulness can play in the diffusion of management and IT innovations (Fiol and O'Connor 2003; Swanson and Ramiller 2004). Individuals in a mindful state might be able to partly overcome the cognitive and contextual difficulties embedded in interpretation, by adding richness to held schemata, thereby improving their capabilities to interpret incoming cues (Weick et

al. 1999). Mindfulness, as a state that induces rich awareness of discriminatory detail, enables potential adopters to interpret environmental information about the innovation in a way that is attentive to the uniqueness of their own circumstances (Fiol and O'Connor 2003; Swanson and Ramiller 2004), to carefully consider messages coming from the environment (Baskerville and Myers 2009), and to be skeptical about the "local validity" of broad and overly simplifying claims about the innovation made by institutional actors (e.g., appeals to best practice) (Swanson and Ramiller 2004). Further, mindful actors, being characterized by commitment to resilience (Weick et al. 1999) will be more open to engage in experimentation "on the fringes of current operations", which in turn allows them to augment the span of plausible actions and gain insights into potential outcomes (Fiol and O'Connor 2003); from a sensemaking perspective experimentation is concrete action and should broaden up and refine cause maps, thereby contributing to richer interpretative processes (Weick et al. 2005). Similarly, mindful actors, eager to gather diverse interpretations, will reach out to their social network for assistance with interpretation (Swanson and Ramiller 2004). Thus, interpretation can be a social activity in which community ties may play a salient role.

By contrast, mindlessness is a state that offloads cognitive effort to the environment. In the context of this discussion, there are at least two ways in which a mindless state can harm interpretation. First, actors in a mindless state will tend not to read too much into subtle or ambiguous cues signaling a need for change (e.g., new IT), and thus fail to develop adaptive responses to them (Weick et al. 2005). Second, the interpretation made by an actor in a mindless state will tend to be less sensitive to organization specifics (Fiol and O'Connor 2003; Swanson and Ramiller 2004), and not likely to surpass or challenge

the general statements contained in organizing visions available at the institutional level (Swanson and Ramiller 1997). In other words, a mindless state will not enable the actor to go beyond "familiar and known behaviors based on what others are doing" (Fiol and O'Connor 2003, p. 59) and might lead to adoption even under circumstances when doing so may not be the most sensible response for the business.

Against that background, interpretation of cues in small businesses will primarily rely on the owner's cause maps, and secondarily on cause maps held by members of staff who interact with the owner. By definition these maps are inaccurate, incomplete and overly simplifying. However, it is reasonable to expect that prior IT-related education and experiences will add complexity and nuance to cause maps held by business owners, if no accuracy. Interpretation will render a certain IT product or service as a viable, desirable, required, or maybe just the opposite. Cues related to situations where the company is deemed to be underperforming will likely be interpreted as failures, and trigger responses. Anything viewed as less problematic – i.e., non-failing– might be noticed but dismissed. Evidently, a risk is that the encoding of experiences as a failures / non-failures in a small business context will most likely depend on extremely sketchy cause maps, thereby being prone to miss or misrepresent important details that, if added, would possibly change the failure / non-failure verdict.

Moreover, cues will often be equivocal and will require further work. Knowledge constraints can aggravate equivocality, and time constraints can limit the amount of work done to disambiguate incoming cues. However, business owners may undertake such work if they believe that their stakes in the situation are high, because making changes to IT is seen as a risky endeavour, or because bearing the outcome of inaction is perceived

as overly costly. It is important to remember that the person's financial viability is intrinsically tied to the business ability to survive and succeed. Thus, changes which are thought to affect the business resources or its likelihood of survival are bound to be mindfully construed. As far as interpretation is concerned, this means that business owners will try to go beyond interpretations of IT available at the environmental level, and will consider their own circumstances. Importantly, they will factor in limited resources and personal consequences. Thus, small business owners are likely to display a vigilant, cautious attitude in relation to why, when and how resources are consumed. To assist in interpretation, business owners might experiment and they might engage in boundary spanning activities. For example, they might use software trials, to envision how a new piece of IT might improve performance in an area of the business that is underperforming, and they might reach out to people in their social network to gather interpretations of the technology being considered. New meanings connecting IT to the business will emerge from these actions, and those that seem to work (i.e., principle of plausibility) will be used to rationalize and stabilize the course of action being tried out, and will be retained in a simplified version for later use.

Conversely, if stakes are not perceived as high, small business owners might be less cognitively engaged with the situation, put less effort into interpretation, perhaps taking environmental claims regarding IT innovation at face value, or failing to distil the value of certain opportunities knocking on their doors.

3.3 Responses

Interpretation of cues leads to a response. The range of responses to IT-related cues might be as wide (or narrow) as the actor can construct, including but not limited to the

acquisition or rejection of a new piece of IT. In this section I discuss various responses suggested in the examined literature which are relevant to the IT encountering perspective. The Carnegie School essentially considers a binary set of responses: performance outcomes interpreted as within or above aspiration levels are encoded as successes and they will tend to be met with routinized responses or inertia, whereas performance outcomes interpreted as below aspiration levels are encoded as failures and they will trigger search for new forms of action (Cyert and March 1963; Levitt and March 1988; March and Simon 1958). Search, however, mustn't be interpreted in the neo-classical optimizing sense (Stigler 1961), but rather in the cognitively-bounded and satisficing version that this very school has put forward (March and Simon 1958). This means that individuals will assume simple concepts of causality based on previous experiences, and will tend to stay within the neighborhood of known alternatives, settling for a response that seems good enough for addressing the situation at hand. This clearly raises a concern regarding whether typical small business owners, without some outside assistance, will generally be able to find their way around the convoluted IT marketplace I described in previous chapters.

This binary set of responses has been qualified in at least two ways. First, it is recognized that even when outcomes are encoded as failures, search is not the only response possible. Alternatively, individuals might lower their aspiration levels so that the attained outcome meets their adjusted expectations (i.e., the failure is no longer framed as such), or they might decrease organizational slack, thereby reducing or halting their search efforts (Cyert and March 1963; Levinthal and March 1993). Second, there is the thorny problem of stubbornly ambiguous outcomes, which are those that do not fit comfortably

as successes or failures, either because the situation in itself is ambiguous (e.g., near misses) or because the observer lacks frameworks of reference with which to interpret it (Levinthal and Rerup 2006; Rerup 2009). To understand responses to such outcomes, scholars have recently started to add insights from the sensemaking and mindfulness perspectives (e.g., Christianson et al. 2009; Rerup 2009); these approaches to responses will be summarized below.

Sensemaking is about action, so interpreting and responding can only be distinguished from each other analytically. In practice, individuals who are interpreting a situation are at the same time trying out responses and making sense of them, and this action only stops when a response seems to work and a plausible interpretation of it is retained for future use (Weick 1979; Weick 1995). In this way, experimenting can be present in IT encounters and it might lead to IT adoption, but it does not presuppose adoption, it just means that decision makers will dip their toes in the water before committing to a course of action.

Work on mindfulness applied to diffusion of innovations (Fiol and O'Connor 2003; Swanson and Ramiller 2004) has advanced the idea that mindful potential adopters, by paying careful attention to their own circumstances as opposed to absorbing superficial interpretations grounded on broad institutional claims, may halt action that is deemed risky or unnecessary. This alternative view has important implications regarding responses to environmental stimuli, insomuch as actors may respond by adopting the innovation in some cases, by deferring adoption if they believe their organization is not ready for it, or by rejecting the innovation if they believe there is a poor fit between the innovation and their organizational context (Swanson and Ramiller 2004). Further, given

that mindfulness is manifested by a preoccupation with failure (Weick et al. 1999), mindful organizations will be prudent and defer or reject an action if signs in their own context indicate that they might fail (Swanson and Ramiller 2004). By contrast, a mindless state might lead to a mimetic response, hence the adoption of fashionable technologies (Swanson and Ramiller 2004), or to the non-adoption of a technology that would be useful but is missed or discarded by the potential adopter.

Both the sensemaking and the mindfulness perspectives are linked to the idea of resilience by improvisation (Weick 1993; Weick et al. 1999). Faced with ambiguous or novel situations, and sensitive to context particularities, individuals or organizations may be able to use the open space afforded by their background knowledge and accumulated hands-on experience to develop creative responses by recombining known elements in new ways. Therefore, the repertoire of responses of an organization may be as wide as its knowledge inputs allow (Weick 1993). To emphasize this idea, Weick has often gone back to the systems theory law of requisite variety, which states that for a system to be viable, the variation it may display for coping with external variety must be greater than the variation found in the environment (Ashby 1956).

In their IT encounters, small business owners can attempt a diverse set of responses, as varied (or limited) as they can construct, and contingent on the importance attached to the issue at hand. These responses include but are not limited to adopting IT. Business owners facing situations construed as failures, and deemed important for business survival and success, might search for a satisficing IT alternative. Arguably, search behaviours will be affected by the owner and their staff understanding of market alternatives, and these behaviours will tend to be ad-hoc, since search capabilities may

not be systematized into repeatable processes. Small business owners might also try to experiment at a low cost and reach out to social ties for advice, in order to enhance their knowledge of possible courses of action. Yet, in light of their resource constraints, their decision making autonomy, and the intertwining of personal and business considerations, business owners might try to safeguard limited resources from unnecessary, excessive or potentially unfruitful consumption, by lowering their performance expectations in the face of adversity, thereby deferring both search and potential adoption, or by crafting non resource-intensive solutions.

Theoretically contrasting situations may lead to different responses. More specifically, situations which are not viewed as failures, or which are not construed as affecting business survival and success might be met with inertia. Small scope IT changes, which are not expected to utilize large amounts of resources, hence not seen as risky from a resource consumption perspective, might be undertaken more readily, under a rationale akin to mimetic isomorphism.

Importantly, the theoretical synthesis I present above makes it possible to view deferring and rejecting adoption as potentially sensible responses if small business owners, aware of their own circumstances, perceive the move towards adoption as premature, unnecessarily risky or costly, or simply not needed for their business. The notion of mindfulness in particular opens up the possibility of seeing non-adopters and late adopters in a more positive light, as thoughtful or cautious actors. This interpretation is radically distinct from conventional innovation literature, regularly affected by the pro-innovation bias, as discussed in Chapter Two.

At this point, two qualifications are in order. First, it has not been my intention to use the literature to predict in any precise way patterns of attention, interpretation and responses among small businesses, I have only sought to describe how these literature streams illuminate the IT encountering perspective. Put differently, I have intended to use these theoretical ideas in a way that is consistent with what Gregor (2006) calls "theories for explaining", Klein and Myers (1999) refer to as "sensitizing devices", and DiMaggio (1995) refers to as the defamiliarizing purpose of theory. That is, the primary concern has been to use theories for developing alternative explanations about why and how phenomena occur, rather than making testable predictions about the future. This remark shall set the record straight if my imprecise use of the language suggests prediction as central theme in my discussion.

Second, in no way does my discussion aim to suggest scholars shift gears and start seeing non-adoption as a necessarily desirable state of affairs for small businesses. It seems clear to me that non-adoption, seen from this theoretical standpoint, can sometimes be a maladaptive response. That would be the case, for example, when problems are not being addressed but swept under the carpet (Weick et al. 2005). My point, instead, is that these perspectives add fairly specific theoretical tools to observe non-adoption responses in either a positive or a negative light, thereby making it possible for the researcher to hold a more balanced a priori stance towards adoption. In other words, any judgements about the appropriateness of adoption or non-adoption responses will need to wait until the specificities of the context are accounted for. I believe such a possibility is not clearly open in conventional IT adoption frameworks.

Chapter 4   Conceptualization of Small Businesses

The definition of small businesses used in this research has been conceived with the purpose of assisting the efforts of theorizing about the IT encountering process. That is, this definition seeks to stress the structural features of small businesses that might affect the way in which business decision makers attend to IT-related stimuli, interpret them and respond to them. Therefore, the definition pays special attention to the *individual making decisions* on behalf of the business and their *decision making capabilities*, while considering the *resources* this individual can make use of and simultaneously needs to protect as part of the decision making process.

To build this definition, I examined previous literature on small businesses, paying attention to how these studies had defined and characterized small businesses. Extant definitions recognize small businesses as independently owned and managed firms with a non-dominant market position, and not exceeding the measurement cut-off values established by national legislations, which generally look at number of employees, sales or assets (OECD 2005; SBA 2014). An alternative well-cited definition, by Carland et al. (1984) distinguishes entrepreneurial firms and their owners from other small businesses and owners, on the basis of the innovation proclivity and strategic behaviour deployed by the former, vis-à-vis the latter. Other noteworthy features of small businesses which are regularly highlighted in prior research on small businesses conducted in the IS discipline (e.g., Caldeira and Ward 2003; Grandon and Pearson 2004; Kendall et al. 2001; Poon and Swatman 1999; Thong 1999) and outside it (e.g., Dean et al. 1998; Dodge et al. 1994; Okamuro 2007; Terziovski 2010; Williamson 2000; Winborg and Landstrom 2001)

include reactive behaviour, resource constraints, informal structures and procedures, owner-centralized decision making, and flexibility for action. Interestingly, these characterizations seem to have led to two competing images of small businesses: the image of fluid and quick-moving businesses strategically positioned in niche markets (Chen and Hambrick 1995; Dean et al. 1998), and the alternate image of businesses either lacking the minimum resources to temper tough beginnings and ensure long-term survival (Bruderl and Schussler 1990; Thornhill and Amit 2003) or struggling with limited means regardless of their age (Dodge et al. 1994; Williamson 2000; Winborg and Landstrom 2001). IS research on small businesses is closer to the second image, hence conceiving small businesses as organizations lacking the necessary financial means, knowledge resources, time, or technical and management skills to understand and embrace IT innovations.

Another distinguishing feature of small businesses is related to the mingling of the personal and the business domains in small firms (Scott and Bruce 1987). Not only is this feature extensively discussed in the family business literature, but it is fact essential to various definitions of family businesses as organizations where family-oriented interests and behaviours are especially salient and might override business-oriented action (Astrachan et al. 2002; Chua et al. 1999). With only few exceptions (Harwood 2011; Wang and Ahmed 2009), IS studies on IT innovation by small businesses have not explored the overlap between the personal and the business domains occurring in these businesses, or the conflicts that might result from it.

In addition to prior literature on small businesses, I drew on broader conceptualizations of capabilities and resources employed in decision making processes to inform my own

definition. Concerning capabilities, prior research recognizes that individual cognitive

capabilities, namely the ability to process, store and retrieve information, play a central

role in decision making processes, and further notes that these capabilities are limited and

fallible (Todd and Benbasat 2000). Regarding resources, a stream of research on

strategic management has defined them as physical, human, and organizational assets,

tangible and intangible, owned and controlled by the firm (Barney 1991). When a

distinction is made between resources and capabilities, then resources are seen as "stocks

of available factors that are owned or controlled by the firm", and organizational

capabilities refer specifically to information-based processes, or routines, which use the

firm's resources in specific ways (Amit and Schoemaker 1993; Eisenhardt and Martin

2000). Thus, resources are employed in processes which are carried out by firms for

specific purposes. Both available resources and capabilities are brought to bear to

decision making processes, and certain attributes of resources (e.g., rare) and capabilities

(e.g., dynamic) are thought to improve decision options (Winter 2003) and generate

sustained competitive advantage (Barney 1991).

Against this background, I define a small business as an organization having the

following constitutive features:

1) Independently owned,

2) having senior management centralized on the owner(s), who have full autonomy to

   make all business decisions,

3) largely dependent upon the owner(s) own physical resources (e.g., financial,

   technological, location, time) to carry out business activities, hence enabled and

constrained by the amount of physical resources the owner(s) have and are willing to invest in the business[4],

4) similarly dependent upon the human resources (e.g., knowledge and skills) organizational resources (e.g., structure, advice networks) and capabilities (i.e., processes) that the owner(s) and their staff are able to provide, establish and maintain for the business, to act and make decisions, and,

5) inherently affected in their acting by the tensions the owners might experience as they try to balance their work and personal goals and activities in everyday life.

This definition omits a few features which I identified in the literature as characteristic of small businesses. Namely, I have discarded reactive behaviour, informality and flexibility from my definition, because I do not see them as core properties of small businesses, but as reflections of structural features which might vary depending on resources and capabilities possessed or developed by individual businesses. Likewise, this definition does not consider the distinction between entrepreneurial firms and small businesses (Carland et al. 1984), it encompasses both type of firms.

Given the iterative nature of qualitative research, this definition has been shaped by data analysis to some extent, but more importantly it has been a crucial tool for theoretical development, by helping me notice how limited resources and capabilities affect what small business owners are likely to know about IT innovations and competing IT alternatives before embarking on IT choice processes. Similarly, this definition has made me consider how limited resources, the owner's full control over their use, and the

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[4] It is possible that this aspect of the definition leaves the door open for businesses owned by wealthy individuals, hence for relatively resource-rich businesses which do not fit into the spirit of the definition. Yet, both worldwide income distribution statistics and common sense shall provide enough support for my claim that I am looking to describe the majority of businesses as resource-constrained and not resource-rich businesses.

tension between personal and business space could also affect business owners' thoughts and reactions in relation to IT-related stimuli. In brief, working from a conceptual definition and refining it along the way, has enabled me to generate the idea of IT encountering and to further develop my thinking around it.

Chapter 5   Methods

The study employs a longitudinal research design based primarily on qualitative data collected through semi-structured event-based interviews with a diverse group of small business owners at two points in time. 29 businesses owners were interviewed in 2011 and 13 of them were interviewed a second time in 2014. The method fits adequately the research question and the setting for the reasons discussed below.

5.1 Research Design Considerations

This study seeks to shed light on the IT encountering process, as defined earlier in this document. This means that by means of the empirical study, I set off to explore the various ways in which small business owners encounter events indicating IT as a plausible course of action, interpret these events and respond to them. Because people's interpretation of events is central to the study, appropriate methods need to give voice to the individuals facing these events in order to learn from them, rather than imposing the researcher's voice from the start. In general, qualitative methods lend themselves better to questions of meaning, and are known to generate rich data with which to support the development of theories concerned why and how questions (Eisenhardt 1989; Strauss and Corbin 1998; Yin 2009).

A wide diversity of qualitative methods and sources exist. Most common sources of qualitative data include interviews, participant observation, and archival data. The last two were not feasible in my research context. Pollock and Williams (2007) have noted that IT procurement decisions are infrequent, short-lived and ad-hoc. Low frequency and

short duration, coupled with the relative laconism and isolation within which some of these cognitive processes might occur, made participant observation extremely impractical and of potentially limited value. The use of participant observation could even compromise the quality of gathered data if behaviours were affected by the sole presence of the researcher. Further, formal documentation around these events is very limited in small businesses, which means that archival data are virtually non-existent. Interviews, on the other hand, could yield abundant data specifically concerned with the cues, interpretations and responses around the topic of interest.

But a design based solely on interviews would not be free of methodological concerns. In this setting, a first concern is that collected data be distorted by cognitive biases associated with retrospective data collection. Retrospective self-reports are vulnerable to recall difficulties, as well as rationalization and hindsight biases (Huber and Power 1985). This observation has been particularly made in contexts that are relevant to this work, such as adoption of innovations (Rogers 2003), entrepreneurial action (Davidsson and Honig 2003), and social networks use (Borgatti and Cross 2003). To partly guard against those biases, the interview questions were centred on concrete events, following critical incident technique guidelines (Chell 2004; Flanagan 1954). Asking participants to report on specific events, rather than asking them broad questions that force them to make composite "complex inferences or judgements about themselves based on many past events" (Judd et al. 1991 p. 214), should diminish the cognitive effort required to answer questions, and should enhance recollection of specific details (Chell 2004). Likewise, to abate the effects of memory failures on the data, I sought to capture a combination of past events (happening during the three years preceding the interview) with events taking

place at the time of data collection. Although I cannot ignore the risk of those biases being present in the data, I did notice that asking repeated questions around the same event helped some participants remember some details more precisely. Further, memory failures are most problematic in variance studies, especially in experimental and survey research, when differences in recall across time or among subjects may artificially distort the magnitude of statistical effects (Raphael 1987). Memory failures are still a concern for this study, but a less severe one.

A second concern is that using interviews as a single data source negatively impacts the quality of the results. The argument against using a single data source is that doing so cannot render the rigour reassurance that comes from triangulating across various types of data sources and obtaining convergent findings (Jick 1979). However, a similar reassurance can be obtained from having multiple informants, comparing their accounts and arriving at convergence of findings in this way, a variant known in the literature as source triangulation (Denzin 1970). That was the path I followed in this study.

In the context of small businesses, opting for a multiple-informant design is analogous to having a multiple case study design (Yin 2009), since each informant can arguably speak for only one company and most companies will not have more than one knowledgeable informant, usually the business owner. In these designs, it is recommended that researchers follow a sampling strategy based on theoretical replication, and attempt a number of four to ten cases (Eisenhardt 1989; Yin 2009). Yet, theoretical sampling strategies presuppose a level of knowledge about the sites which is not necessarily achievable ex-ante when the research sites are small businesses. Specifically, seemingly relevant sampling criteria for this study, such as individual IT knowledge background or

criticality of the event, cannot be known before the interview. I decided to use a larger, diverse sample in terms of owners' demographics and business characteristics, in order to facilitate replication and extension via comparative analysis, in spite of the limited knowledge I had of the cases at the moment they were included in the sample. A larger sample could also strengthen source triangulation, as explained above.

Finally, the choice of a longitudinal design is explained by my interest in looking into the processual aspects of IT encountering, which demands empirical attention to the unfolding of events over time (Langley 1999; Langley et al. 2013; Newman and Robey 1992).

5.2 Operationalization of Small Businesses

I used four size-related criteria to select small businesses for participation in this research: eligible businesses had to be independently owned, have senior management centralized on the owner, have 50 or fewer employees, and have annual revenue of up to $1 million. These criteria draw on the definition presented in Chapter Four, and also build upon prior operationalizations, as I explain below.

The first two criteria are direct reflections of the first two features contained in the employed definition. The last two criteria attempt to capture features pertaining to the dependence of these businesses on limited individual and firm level resources and capabilities for operation and decision making. There are no hard and fast rules about how to convert these features into measurement limits. Indeed, a wide variety of cut-off values concerning number of employees, sales or assets have been used in prior research to operationalize small businesses. Appendix C presents a review and a discussion about

this issue. Here, I note two conclusions that stand out from that review. First, prior work has generally operated within the measurement limits issued by government agencies, which range from fewer than 20 employees in Australia, to up to 500 employees in the United States. This disparity means that knowledge has been built on the basis of businesses which differ greatly in terms of size, certainly more than it would be preferable for building cumulative knowledge about *small* businesses.

Second, several past studies have chosen to exclude very small firms (i.e., 20 employees of fewer) from their samples so as to improve the chances of surveying companies with some level of IT involvement. This practice has had the unintended consequence of moving our knowledge base further away from these very small businesses, which is a problem because these businesses are the largest segment of the small business population in most countries, usually being around or above 90 percent of all existing businesses (OECD 2010). Reasonably, one can be concerned that the empirical base upon which knowledge about small businesses rests is formed by quite atypical larger businesses (Molla et al. 2006).

My operationalization has sought to be compliant with measurement limits set by Canadian and Colombian governments, since data were collected in these two countries, and it also reflected my interest in contributing to efforts to produce knowledge relevant to the smallest in size, most vulnerable, and most heavily populated segment of the small business universe.

5.3 Participants

At time 1 (2011), with due ethics approval (shown in Appendix D), I identified potential participants in local directories listing businesses in geographical areas accessible to me in Canada and Colombia. Three criteria were used to select eligible participants: small size of the business (as mentioned above), availability of the main decision maker for interview, and confirmation that decisions relevant to the study's topic had been made within the previous three years, or were being made at the time of interview. 29 small business owners who agreed to participate and met the selection criteria were interviewed. In addition to interview data, some demographic data about the owner and the business were collected through written forms. Table 3 shows some descriptive information about participants and their businesses. The first 14 participants had their businesses in Canada, the remainder had them in Colombia. As shown, variety was obtained in demographic variables known to affect IT adoption (i.e., owner's gender, age, and education level, and business's industry and size).

Table 3: Summary view of demographic characteristics of participants

Actor's ID	Owner			Business	
	Gender	Age	Highest level of education	Main area of work	Number of employees
1*	Male	28	Bachelor's degree	Construction services	2
2	Female	51	College degree	Arts and crafts	1
3	Female	41	College degree	Fashion design	2
4*	Male	41	College degree	Construction services	1
5	Female	57	Professional certificate	Bookkeeping services	3
6	Female	44	High School degree	Arts and crafts	4
7	Female	53	College degree	Event planning services	1
8	Male	39	Pursuing Masters	Waste collection services	12
9	Male	35	College degree	Graphic and web design services	3
10*	Male	39	Pursuing PhD	Publishing services	2

Actor's ID	Owner			Business	
	Gender	Age	Highest level of education	Main area of work	Number of employees
11	Male	47	College degree	Wholesale trade	26
12*	Male	34	High School degree	Web design services	18
13*	Male	48	No data	Insurance and Investment advice	2
14	Male	64	College degree	Home furnishing retail	9
15*	Female	45	Master's degree	Market research services	4
16	Male	27	Master's degree	Telecommunication services	5
17*	Female	62	Bachelor's degree	Leather manufacturing	5
18*	Male	58	High School degree	Leather manufacturing	5
19*	Male	54	Bachelor's degree	International trade services	3
20*	Male	57	Master's degree	Accommodation services	29
21	Female	37	Postgraduate diploma	International trade services	50
22	Female	ND	Bachelor's degree	Food manufacturing	2
23*	Male	56	Bachelor's degree	Performing arts	24
24*	Male	40	Pursuing Masters	Legal services	37
25	Female	52	Master's degree	Chemical manufacturing	36
26	Male	58	Master's degree	Management consulting services	16
27	Female	43	College degree	Telecommunications reseller	1
28*	Female	31	Pursuing Masters	Event planning services	3
29	Male	40	Bachelor's degree	Industrial Design services	5
Summary	17 male 12 female	Av: 45.8 SD: 10.1			Av: 10.7 SD: 13.0

* Interviewed at time 1 and time 2. All others were interviewed only at time 1.

5.4 Data Collection

In order to study actual occurrences of IT encounters, participants were asked to talk

about events where a decision had been made or was being made to acquire (or not) IT.

Data collection was informed by the critical incident technique (CIT) (Chell 2004;

Flanagan 1954). This ensured that collected data were anchored in actual instances of IT

encounters. In that sense, CIT was helpful for enhancing contextual understanding while

narrowing down the inquiry to specific events. Most but not all collected data refer to

past events: 8 percent of events were taking place at the time of interview, 29 percent had

occurred during the year before, and the remainder had started over a year before the interview, but many of those were part of sequences of events for which more recent developments were also captured.

Interviews were semi-structured and the interview protocol (shown in full in Appendix E) had three parts. In the first part, researcher and interviewee worked together to define the decisions to be covered in the interview. In the second part, exploration was oriented towards the context prior to the decision, including questions such as "What was happening at the business when you started to think about….?", "What was the role expected from IT?" "Was there a particular event that really made you consider the possibility of …?", "Who came up with the idea of …?", "Did you consult with any other person?", "Why?" "What did they say?", "Did you consider any other alternative?", "Did you try to find information about alternatives?", "how did you do it?". The third part was oriented towards the views and previous experiences of the decision maker in relation to IT, and included questions such as "For your personal life, what do you think about IT?" "And for businesses?", "Have you made other similarly important IT decisions in the past?". 27 interviews were conducted in person and 2 by phone. The average duration of interviews was 65 minutes, with the shortest one lasting 37 minutes and the longest one 2 hours and 50 minutes, for a total recorded time of 31.4 hours. Data were transcribed verbatim and participants were given the opportunity to review, comment and correct the transcripts.

At time 2 (2014), the same individuals were contacted for a second interview. 6 of them had gone out of business or retired; from the remainder, 13 were interviewed, 7 declined and 3 agreed to be interviewed but were unable to suggest a convenient time within the

twelve weeks allocated for data collection. In the time span between time 1 and time 2, I had maintained a connection with them (i.e, by having them comment on the transcript and by sharing with them an interim report written for participants), which facilitated contact and rapport. Interviews were conducted in person, by video call or by phone, and were semi-structured. The approach was to pick up the conversation where it was left off, focusing specifically on how the decisions and themes discussed in 2011 had developed, while encouraging the surfacing and exploration of new incidents. I also made purposeful attempts to spend more time on themes where ongoing analysis suggested more depth was needed. The average duration of interviews at time 2 was 32 minutes, with the shortest one lasting 15 minutes and the longest one 41 minutes, for a total recorded time of 6.8 hours. Data were also transcribed verbatim and participants were again given the opportunity to review, comment and correct the transcripts.

A typical interview would proceed as follows: we started with an informal update on the business and/or the individual situation, then I briefly recounted the main topics covered at the first interview and I explained that we would talk about all of them, one at the time. For each topic, I first asked whether they still were on the same technology or not. If there was an indication of continuance, I explored usage and satisfaction, which could help elicit cues (or lack thereof) and interpretations. When discontinuance was indicated, I explored the reasons for it, the actions performed, and any other details around the decision to discontinue. Oftentimes, I would present them with the rationale they had shared with me at the first interview, to have them elaborate on changes in the environment, changes in their interpretation, or both. In all topics, I tried to produce richer answers by asking for examples, clarification, or by using short interjections to

show interest. Occasionally, their answers seemed at odds with what my evolving

theoretical understanding would suggest, and I used these situations to dig further into the

environmental cues, interpretation processes and responses at play. New events, either

emerging organically during the interview or deliberately introduced by means of

additional questions, were picked up and discussed towards the end of the interview.

5.5 Data Analysis

I used an iterative approach to develop the process model of IT encountering introduced

in this document. The approach started with an inductive analysis of the data obtained at

time 1, continued with a series of oscillations between the data and various literatures

which refined my understanding of those data and strengthened the theoretical direction

of my work, and concluded with the addition of data at time 2, and a revised process

analysis of all collected data, which was rooted in the attention to cues – interpretation –

responses triad, and aware of the evolution of those processes in my empirical setting

over time. I will discuss each of these three steps next.

5.5.1 The Inductive Analysis

My first examination of the data was conducted inductively. I elicited themes and

subthemes from the data and organized them into a meta-matrix display (Miles and

Huberman 1994) ordered by such themes and subthemes on one axis, and by decision

maker and decisional event on the other. Albeit complex, this way of displaying the data

facilitated the comparative analysis that followed, while retaining both the individuality

of each event and the context about the decision maker that glued together several events.

At this point, I built a second matrix which condensed data from the first matrix and

added demographical data of participants and their business. This new matrix was used to note potential patterns of associations across themes, decision makers, and events. The emerging findings were validated by going back to each transcript and ensuring they would still hold in the original context. Analytical generalizability of the findings was addressed by means of cross-case analyses (Miles and Huberman 1994).

A central objective of the inductive analysis was the production of an interpretation of the data that was credible in the realm of practice, and would thus be a better input for working in the realm of theory at a later stage. Lincoln and Guba (1985) define credibility as the attribute that renders the described human experience immediately recognizable by those participating in it and readily understandable by those outside it. I employed several mechanisms suggested by qualitative methodologists to produce a credible interpretation. Among these mechanisms, I sought and obtained a demographically varied sample (Lincoln and Guba 1985), my use of event-driven interviews for data collection enabled persistent – i.e., focused – observation, I achieved source triangulation (Denzin 1970) and I wrote up a custom-made report with the findings yielded by this analysis, which I informally circulated for feedback to participants, a few owners of similar businesses, and a few individuals with experience as management consultants to small businesses. This report describes a preliminary process model featuring several rationales and paths leading to IT acquisition, as well as the challenges associated with IT acquisition and the mechanisms used to address them. Feedback received was limited by positive. Four people commented on the report, they all oriented their comments towards the portion of the findings that resonated with their own experience, and agreed with my description.

5.5.2 Data – Theory Oscillations

I oscillated between the results of the inductive analysis and various theories, within and outside the IS field, which could help interpret the findings I had obtained. Main theoretical lenses explored included diffusion of innovations (Rogers 2003), institutional theory (DiMaggio and Powell 1983), bounded rationality models of attention, search and decision making (Cyert and March 1963; March and Simon 1958), social networks and social embeddedness of economic behaviour (Granovetter 1973; Uzzi 1997), work on agency (Emirbayer and Mische 1998), sensemaking (Weick 1979; Weick 1995), and mindfulness (Weick et al. 1999). By doing so, I became aware that no single theoretical approach could satisfactorily account for the various rationales and actions revealed by my inductive analysis. While some portions of the findings could be explained with great precision by certain approaches, some other portions were a better fit with other approaches, and yet some other portions seemed relatively uncovered by the theories reviewed. I concluded that even though it was possible to use my findings to try to extend some areas of the theories reviewed, it would be more fruitful to embrace theoretical diversity and attempt to holistically describe and explain the lived experiences of small business owners as rendered in my data.

5.5.3 The Process Analysis

At this last step I re-analyzed the data collected at time 1 using an organizing framework based on attention to cues, interpretation and responses. Simultaneously, I gathered and analyzed data from time 2. The 13 additional interviews provided enough signs of theoretical saturation, inasmuch as changes to the coding scheme and additions to

theoretical memos decreased steadily and disappeared before full completion of the interviews.

In keeping with my definition of small businesses – which recognizes the central role of the business owner and takes note of the role of resources available at the firm level in decision making – I operated primarily at the individual level of analysis, but for businesses with additional employees I moved to the organizational level of analysis to specifically recognize the fact that owners have access to human resources, organizational resources and capabilities pertaining to the business, which go beyond the ones they possess as individuals. Therefore, certain patterns in attention, interpretation and responses are affected by organizational resources which do not reside in business owners themselves (e.g., an employee's expertise with a particular software package), but are seen by business owners, and treated in the analysis, as possessed by the business.

Further details about this step are presented separately, as they are concerned with data reduction specifically.

5.6 Data Reduction

I selected *sequences of decisional events relating to the same type of technology (by core function) and the same person* as the unit of analysis for this study. This unit of analysis may be more easily understood through empirical vignettes:

- If Participant A told me about one or several decisions they had made around their website over a period of time, these decisions would count as one sequence.

- If Participant B had started with a social media (e.g., Facebook) account for their business, and then switched to or added a website, 'social media' and 'website', would be counted as two sequences.

Each sequence may contain one or several time-point intervals. These intervals can refer either to two different points in time at which data were captured, or to analytical distinctions I created based on narratives contained within a single interview about a sequence of decisions. Again, empirical vignettes might better illustrate how I treated time in my analysis:

- During a single interview, participant C might have told me about a severe data loss which prompted them to do backups on CDs, and then continued to explain that they later wanted to retrieve a file, found that the CD was damaged, and decided to subscribe to a cloud backup service. This would be recorded as a sequence about backups containing two intervals: the "CD" and the "cloud" intervals.

- During the interview at time 1, participant D might have told me they were facing difficulties with the reports produced by their accounting software, and that they were having a software developer fix them. At time 2 I would pick up on the topic, and they would tell me that the developer had never managed to fix the problem, and that they were getting by with verbal reports provided by their bookkeeper. This would be recorded as a sequence about accounting software, with two intervals: the "software fix" and the "verbal reports" intervals.

As a result, data were reduced to 108 sequences of events, 70 of which contained two or more time-point intervals, and 38 containing just one time-point interval. There were signals of variety in the unit of analysis in terms of technologies, as shown in Figure 2. The most frequent technology was websites (n=17), followed by desktops (n=7), smartphones (n=7), 2D graphic suites (n=6) and accounting packages (n=6). There are 24 technologies for which I only have one record; the full list can be read by zooming in on the figure.
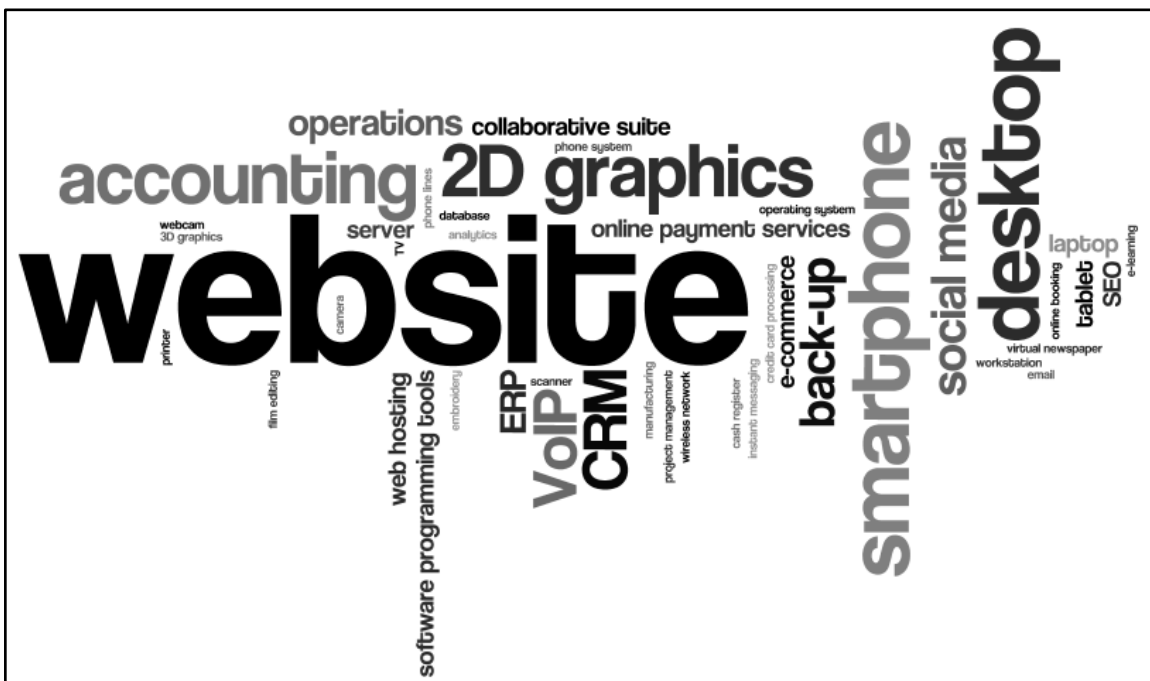
Figure 2: Weighted list of focal technologies in event sequences

Once the unit of analysis and the time units were defined, theme coding started. A two-step coding strategy was followed. First, data were coded using cues – interpretations – responses as the general organizing framework. Coding at this step was also dually informed, but not constrained, by theory and the results of the inductive analysis. For example, the inductive analysis had produced categories such as "inexpensive trials" or

"stretching" which were responses to IT stimuli, and theory would provide concepts such as success and failure as interpretations, or search and boundary spanning as responses.

A snapshot of the coding instrument is presented in Figure 3 for illustrative purposes. The bottom tabs are participant IDs, which means there are 29 tabs, 1 for each participant. Within each tab the red ovals indicate sequences of events, and the blue ovals indicate time intervals. As shown, for each sequence of events at each time interval, data were arranged as cues, interpretation and responses. The coding instruments do not contain data excerpts as such, but my own short notes based closely on interview transcripts.

Figure 3: Coding example

Once all interview transcripts had been coded in this way, I further refined the second-level codes into a uniform pattern coding scheme that I applied to all the 108 sequences of events. These scheme evolved from an iterative process which involved trying out the codes on the data, writing conceptual memos to expand on the meaning of the codes and

capture emergent thoughts about them (Strauss and Corbin 1998), going back to the
literature and the interview transcripts to enrich the memos and further refine the codes,
allowing the codes and memos to evolve as more data were coded, and reworking the
coding scheme when necessary (Miles and Huberman 1994). The resulting coding
scheme is the foundation of the model presented in this thesis.

5.7 Notes on Rigour

Various sets of criteria have been formulated to evaluate rigour in qualitative research. I
focused on Lincoln and Guba's (1985) criteria of dependability, transferability,
confirmability and credibility. Dependability refers to the consistency of the
interpretation throughout the process; in this study I addressed it by going back to each
transcript and ensuring that emerging findings would still hold in the original context, and
I also benefited from a productive student-professor supervisory relationship, which is
known to serve as an implicit audit trail (Baxter and Eyles 1997). Transferability, which
refers to the analytical generalizability of the findings, was addressed by means of cross-
case analyses (Miles and Huberman 1994). Confirmability resides in the audit trail items
produced along the way, which in this study include the analysis matrices and other data
reduction products utilized during the steps described earlier. The actions taken to
enhance and verify credibility were described in my discussion of Step 1.

Chapter 6   Findings

6.1 Model Overview

In this chapter I present a process model which describes how the small business owners I interviewed have noticed, interpreted and reacted to situations involving IT change. The model captures a broad range of IT changes in terms of magnitude and directionality, from tinkering with current technologies, to adopting or switching to new ones, to abandoning them. The model is grounded in the data, and my presentation of it does not seek to go beyond those data unless otherwise stated.

The model is built using three levels of analytical depth. This section introduces the three levels and the main components at each level. More detailed discussions of each component will follow in the remaining sections. The highest level, shown in Figure 4, is rooted in Weick's evolutionary model of organizing (1979), but it rearranges its building blocks for purposes of emphasis and clarity of exposition. The process starts with ecological change as the raw materials which will activate the business owner's attention and will trigger interpretation. Attention and interpretation (i.e., enactment according to Weick's terminology) constitute the model's cognitive core, whereby business owners focus their attention on a portion of ecological change, and as they do so, arrive at plausible interpretations of such change. These two processes are so deeply intertwined in the data that they are kept in a single block in the model. Responses (i.e., selection in Weick's terms) form the model's action core; responses are what small businesses do when faced with ecological change, given how they view such ecological change.

Responses lead to outcomes which feedback into the environment in the form of

ecological change. Therefore, such outcomes may trigger new cycles of attention,

interpretation and responses. Weick's model also contains retention, a component which

addresses the storage and retrieval of usable meanings in the form cause maps. My model

makes use of cause maps and, following Weick, recognizes the mutual shaping taking

place between attention, interpretation, responses, and cause maps. However, cause maps

in my model are discussed under attention and interpretation, to stress their cognitive

nature.
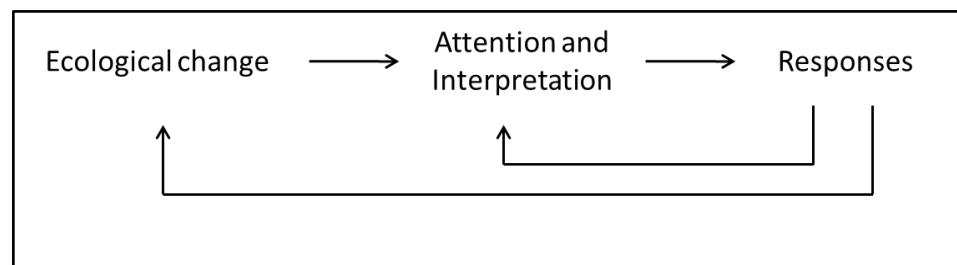
Figure 4: IT encountering model – Highest level

The model's middle level has been developed for two components: attention and

interpretation, and responses. Figures 5 and 6 zoom into the middle level of these two

components, in respective order. Figure 5 suggests that ecological change is met by the

business owner's cause map. This cause map defines which aspects of ecological change

are attended to and how they are interpreted, hence it also affects which responses are

tried out. Cause maps are updated as this process unfolds. Ecological change is perceived

in the form of cues. Cues vary in their ambiguity and strength, hence in their perceived

meaning. Situations in which the business owner faces cues with unclear meanings are

not uncommon. Thus, a central sub-process subsumed within attention and interpretation

is *disambiguation of cues*. This sub-process refers to changes in the meaning of cues

taking place over time, and rooted in purposeful and non-purposeful activities. This sub-process is the model's engine. It keeps attention, interpretation, responses and cause maps in motion.
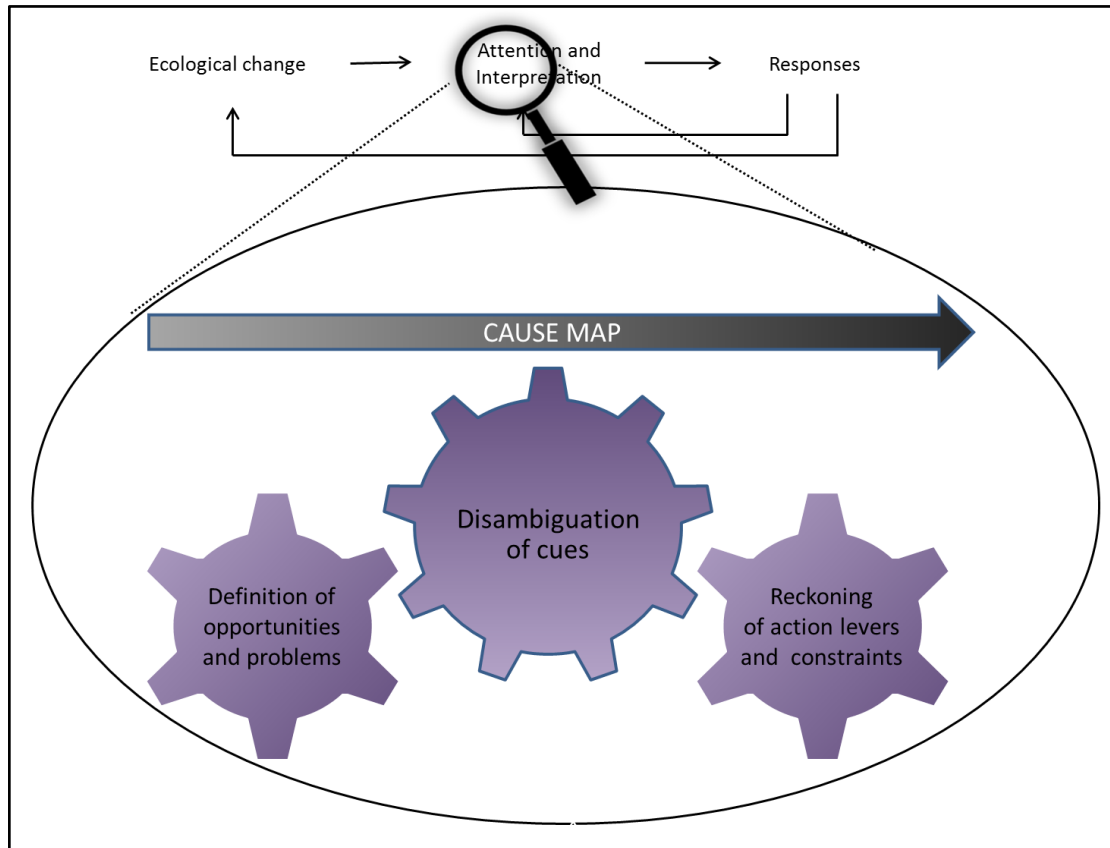
Figure 5: IT encountering model – Middle level: Attention and interpretation

As cues get disambiguated, business owners are able to frame the situation they are facing in a way that enables them to take appropriate action. In the model, such framing is represented by two sub-processes: *definition of opportunities and problems*, where the individual specifies the issue they will act on, and *reckoning of resource levers and constraints to action*, where the individual identifies the parameters (i.e., constraints) that must be taken into account for acting upon the issue. These two sub-processes evolve in tandem with disambiguation of cues.

Figure 6 zooms into the middle level of the responses component. My findings indicate that responses take place in cycles, each cycle representing a different attitude towards the IT change which cues may be suggesting (e.g., adoption of a new technology). *Shunning cycles* group unfavourable responses towards such change, by which business owners will try to minimize the scale of actual change (e.g., by tinkering). *Engaging cycles* group favourable responses by which business owners will attempt to produce an IT change equivalent in scale to the changes most IT adoption research is concerned with (e.g., e-commerce). *Tipping points* represent attitudinal changes (from favourable to unfavourable or vice versa), which I inferred primarily from shifts in the actual responses carried out by the business owners. *Disengaging cycles* group reducing responses whereby a less committed, largely unfavourable attitude follows after a period of engagement with change.
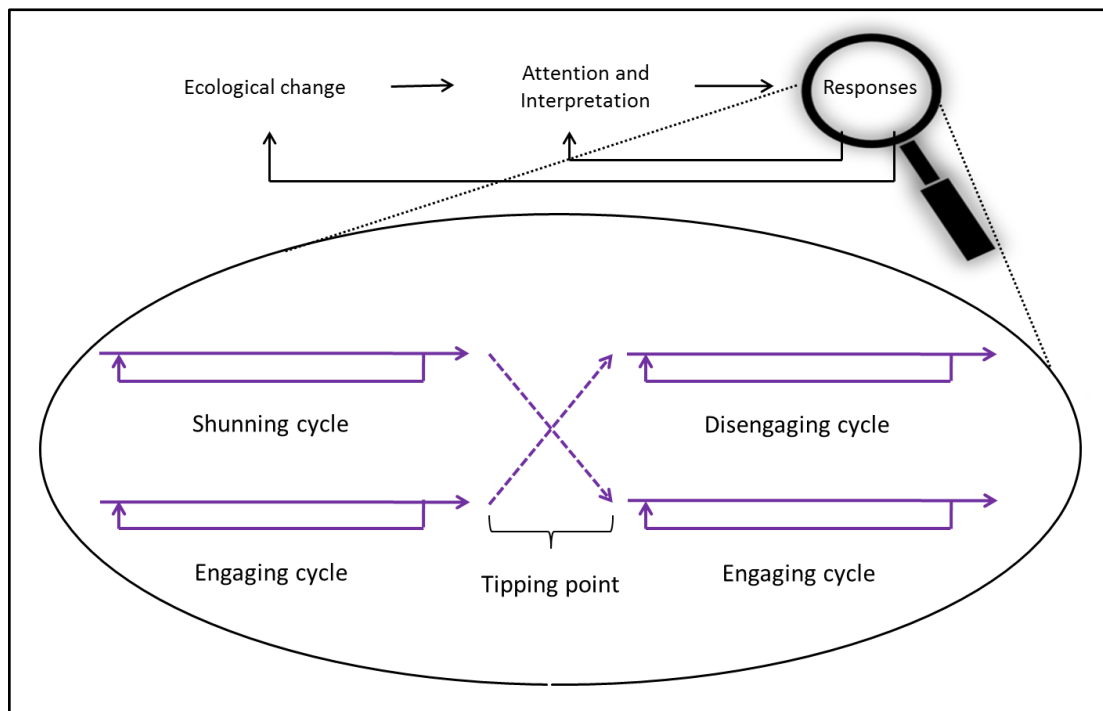
Figure 6: IT encountering model – Middle level: Responses

Responses conduce to outcomes, which represent the decision made as far as the IT change is concerned (i.e., adoption / non-adoption, switch / non-switch, continuance / abandonment). Outcomes are time-bounded. They have consequences which feedback into the environment in the form of cues which might trigger new IT encountering cycles.

The model's lowest level of analytical depth is presented in Figures 7 and 8. These figures offer only a partial presentation which serves the purpose of indicating the model's scope. Figure 7 goes deeper into the reckoning of resource levers and constraints to action, and shows that money, time and knowledge limitations intersect to create distinctively new constraints. For example, sometimes participants would struggle significantly if they had problems with their current IT set-up, did not know about available alternatives which could suit their needs, and did not find the time to look for them. These *intersectional constraints* affect attention and interpretation, for example by making cues more ambiguous that they would otherwise appear, or by obscuring opportunities to take up available technology relevant to the business. Similarly, being situated within the model's attention and interpretation component, these constraints also impinge upon the range and nature of responses which are tried out; more simply put: short on knowledge and time, business owners lack the main means needed to locate suitable alternatives to solve their IT problems.
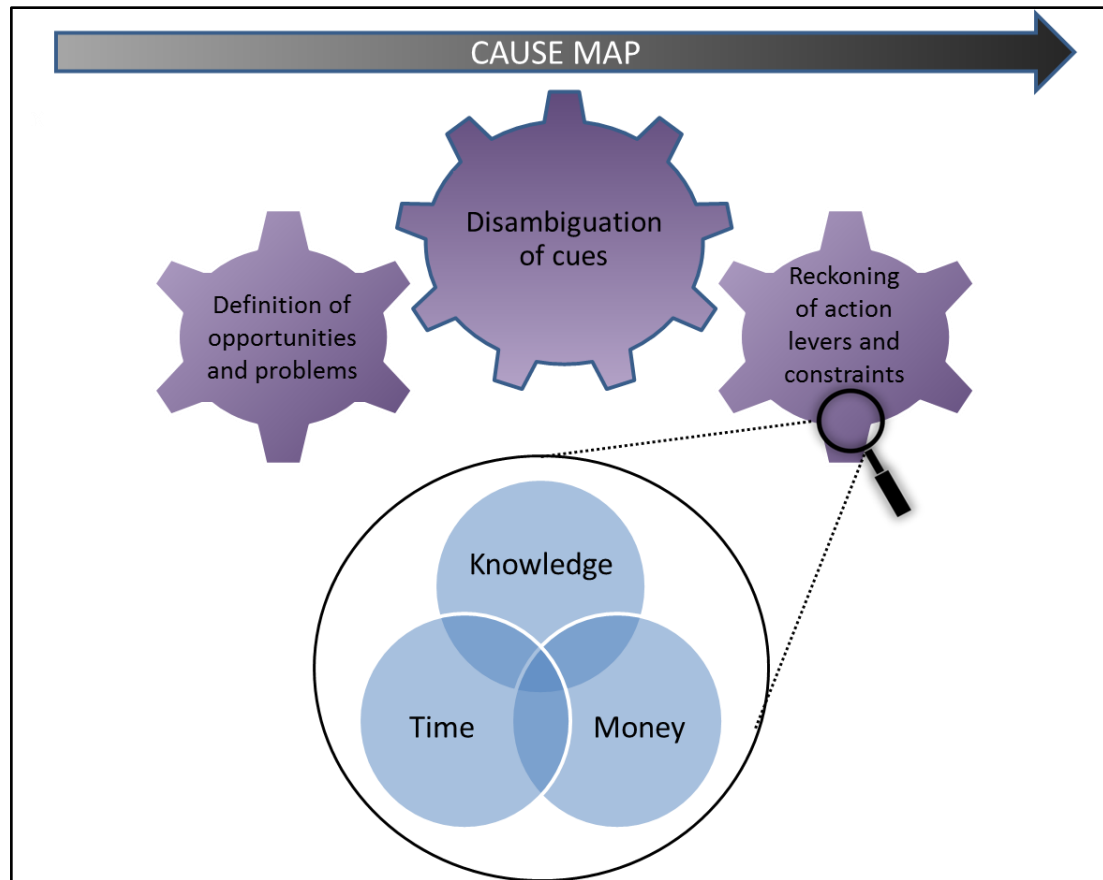
Figure 7: IT encountering model – Lowest level – Attention and interpretation: Reckoning of resource levers and constraints to action

Figure 8 delves into each of the response cycles, offering a view of their internal composition. Shunning cycles, for example, include three responses, namely *tinkering*, *stretching* and *making do*. These responses are consistent with my earlier statement that during shunning cycles, business owners try to reduce the scale of actual change. Thus, shunning responses do not mean inaction, but purposefully minimalistic action, aiming to balance the need for change against the need to preserve limited resources.
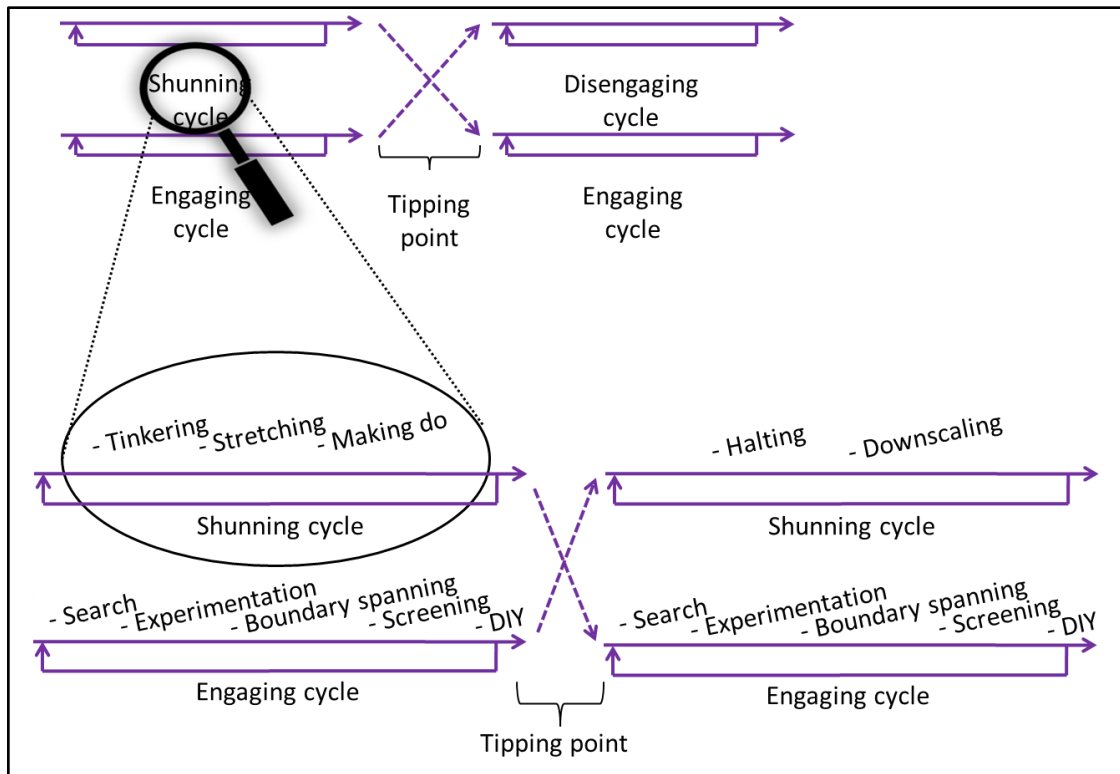
Figure 8: IT encountering model – Lowest level – Responses: Shunning cycles

A summary view of the model, articulating the two higher levels in a single diagram, is introduced in Figure 9. It shows how the model components are interconnected with one another. It must be emphasized that these connections are not linear and do not suggest strictly deterministic paths from ecological change all the way to outcomes. That qualification notwithstanding, the last section presents a few *archetypal wisdoms* identified in the data, which encapsulate notable cause maps used by business owners facing comparable circumstances, for interpreting cues and responding in similar ways.
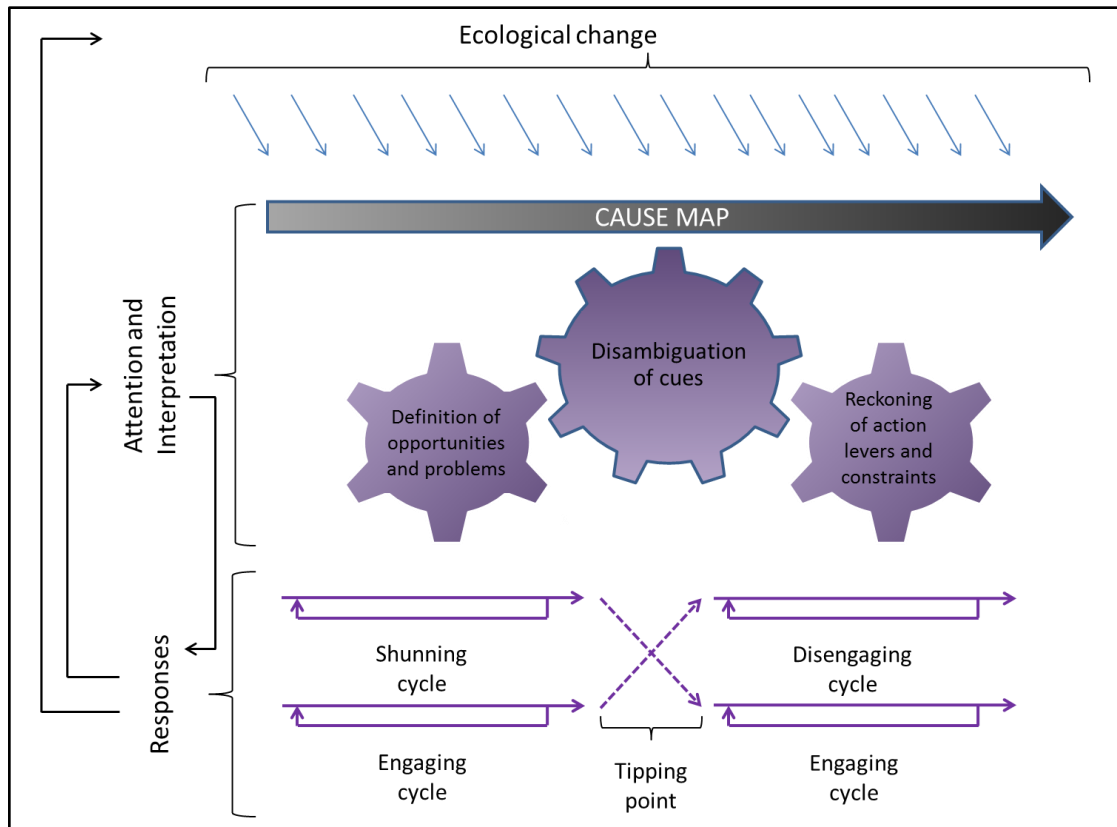
Figure 9: Summary view of the IT encountering model

6.2 Ecological Change

As the world around us changes, we use those changes as the input to organize and give meaning to our daily activities (Weick 1979). By the same token, small business owners regularly encounter changes at the ecological level, which they use to interpret and act upon the situations they face. Sources of ecological change are as varied as flows of experience can be. Ecological changes relevant to IT encountering include such situations as broken hardware or faulty software, deliberate changes in the business' strategic direction, customer requests, vendor offers, participation in training or networking events, and many more. A list of sources of ecological change would be endless, and the effort to produce such a list probably pointless. More important than attempting to list or classify these sources, is noting that such sources cannot be confined solely to the conventional

realms of business or IT. As I report the findings, it will become apparent that attention, interpretations and responses to IT in these small businesses can be equally related to ecological changes affecting the personal realm, such as disease, childbearing responsibilities, or New Year resolutions. In that sense, my findings are consistent with Harwood's (2011), who also notices that in small business settings 'domestic' and 'business' spaces blend together despite attempts of business owners to draw boundaries between the two.

6.3 Attention and Interpretation

Attention and interpretation sit at the intersection between ecological change and action, and rely on cause maps, or previous knowledge held by the person facing ecological change (Weick 1979). Cause maps are brought to bear by individuals to attend to ecological change, make sense of it, try out responses to it, and interpret the outcome of these responses. This occurs in an ongoing cycle whereby cause maps are updated and retrieved again if new changes suggest the need for new responses (Weick 1979). Although attention and interpretation are often activated by ecological changes, cause maps can provide enough raw materials to trigger, in and of themselves, processes of attention, interpretation and action (Weick 1979). In fact, current literature recognizes that both bottom-up (i.e., stimulus driven) and top-down (i.e., schema driven) forces shape organizational attention (Ocasio 2011). My data support this distinction, as they contain some events where very little or no indication or ecological change can be traced, yet attention, interpretation and responses do take place.

Ecological changes are perceived through cues which may activate attentional and interpretational processes. There is great diversity in terms of the relative strength and

ambiguity these cues might display in the eyes of small business owners. By strength I

mean the magnitude of the signal sent by the cues, by ambiguity I mean the extent to

which cues fail to converge on a single plausible interpretation or course of action. While

some cues will appear to be relatively strong and unambiguous, others will appear to be

just the opposite. Sometimes, strong and unambiguous cues appear to accurately reflect

the attributes of ecological change producing the cues, as in the data excerpt below

describing a case of salient software failure:

> *There was a database corruption and we lost some records, the corruption had gone so far back that the backups that we had didn't help us because the corruption was already there; the catalyst was that we started getting weird results out of the [timesheet] reporting, which was problematic because that's how we bill our customers, we work as a services company, much like a lawyer or an accountant, a lot of how we get paid is billing for our time. [When] we realized how bad the problem was, it became an emergency 'aaaaahhhhh!' let's get something else that we can put our times in and use from now on. So it was actually one of our competitors or something like that, they mentioned at some point they were using [name of software product], so I thought well ... if it works for them it might do the work for us.* (Participant 12)

Some other times, the strength of the cues appears to be connected with the structural

position occupied by the individual or organization issuing the cues as well as the

normative expectation contained in the cues, a finding consisting with various streams of

IS and organizational studies (Bouquet and Birkinshaw 2008; DiMaggio and Powell

1983; Swan et al. 2000; Swanson and Ramiller 1997). A short quotation illustrates the

influence of an entrepreneurship program in drawing the owner's attention to the

importance of having a website:

> *To be honest, the [name of entrepreneurship program attended by business owner] at the time was really pushing ... 'You probably should have a website, even if all you have is a digital business card, it is something', so I thought, okay, I'm going to get a website because then it's also that you have your company e-mail which for a lot of people it looks a lot more legit than your name on Hotmail, you know.* (Participant 2)

Upon closer examination, it becomes evident that perceptions of strength and ambiguity

of cues are not only affected by the 'actuality' of the cues or the influential position of the

cue sources, but more importantly by the individuals' mental schemata. Stored schemata

generate a situated capacity to note, diagnose and react to incoming cues. For example,

issues of occupational identity (built into a mental schema) affect interpretations

constructed by professional designers I interviewed, as in the comment below where the

participant's professional background in design has an impact over the interpretation

process by rendering some technologies (or technological responses) as more suitable

than others.

> *We still use a couple of Microsoft things, like we use PowerPoint, Outlook for our e-mail, but we don't really like any of their products. I mean, we've been Apple guys for 15 years. When you go to school that's what you do, you get taught on that, especially with the design based stuff, it is made on Apples right away.* (Participant 9)

Similarly, cues speaking to the identity of the accounting profession might come across

as loud and clear to bookkeepers, and not so much to other business owners. The quote

below describes how identity plays a part in the attention and interpretation displayed by

a bookkeeper regarding the importance of backups and safe document storage:

> Participant 5: *The backup system was the hardest time because we kept hearing about people's stuff crashing, and meanwhile we had these clients that we were responsible for. So we used to do it on CDs, and then we went to doing it on the server, and keeping up the server, and then we finally hired somebody else to do it because it was just too much [...], but then we switched because the first ones ... when we needed our backup they couldn't give it to us and when the person who could give it to us got there, it was already too late for us, because with bookkeeping things need to be done when they need to be done and the payment has to be made that day [...].*
>
> Interviewer: *How often does it happen that you need to go back [to backup files] because something happens and there's something wrong and you need to go and check?*
>
> Participant 5: *Not very often, probably three times in five or six years. It's just that you need to have it. You have these clients that you are responsible for, you've got these people's documents. You've got all ... there's their whole businesses and they count on you, they pay you every month, you know, because you've got all their businesses there. So it's very very important, because if people knew that I was doing their bookkeeping and I didn't have their information ... like when I got the fire, they said: what's the panic? What documents are you telling the fireman...? We were panicking because we had everybody's documents up here, everything and we had a fire up here. So I fought them for the fire hose when they came up. I wouldn't let them spread the water. I actually ended up on handcuffs.*

Whereas the individuals quoted above quickly saw a compelling need to change, defined a relatively clear way forward, and/or engaged in action accordingly, other people, or even the same people under different circumstances, could have missed the cues suggesting such a need, or might have not been able to quickly spot an appropriate matching solution and respond. The IT encountering model identifies three components of the process of attention and interpretation which affect responses, albeit in neither strictly deterministic nor linear ways. These components, or sub-processes, are *disambiguation of cues*, *definition of opportunities and problems* and *reckoning of levers and constraints to action*. They were illustrated graphically in Figure 4. Collected evidence suggests that these sub-processes are interconnected to one another and often co-evolve, but in the interest of clarity I will introduce them separately.

6.3.1 Disambiguation of Cues

Perceptions about the strength and ambiguity of cues are likely to change over time, purposefully or otherwise, in ways that might recreate attention, interpretation and responses; I refer to this empirical observation as *disambiguation of cues*, and treat it as a central sub-process within the model because it tells us that any interpretations business owners arrive at about opportunities, problems, courses of action, etc. are temporally– bounded, they will be subject to revision as new cues become salient and trigger new cycles of attention, interpretation and responses. During the disambiguation process, relatively weak cues build up so as to become stronger and deserving of attention, conflict between different cues are resolved, or the individual increases their own diagnostic capabilities and changes their perception of otherwise unchanged cues. In the data, the build–up of cues is a very ordinary occurrence in which cues of similar nature

accumulate one after the other, and may become stronger, thereby producing a richer picture of the situation which captures the attention of the business owner and facilitates interpretation. A participant described a situation where lack of training in a software program, a possible database malfunction, and bad customer service from the software provider accumulated to provide a clear picture suggesting that change was needed:

> *Over the last 8 months I've had a problem which hadn't happened in many years, which was I had high staff turnover in a very short period of time. So with that, I was left without people who were trained in the software. So what happens now is that it takes [staff] ages to input data, and on top of that the database isn't working, work isn't being saved. But then, when I turned to [software provider] to ask him for support, he came and told everyone off! He told us we were supposed to know all that, he was so rude! He's a very difficult person, there's no way we can work with him, I know I have to find a different software product.* (Participant 21)

Conflicting messages being read from different cues are also frequent, and result in ambiguity. Most conflicting messages I could pinpoint in the data are rooted in the multidimensionality of IT products and services. For example, there is often a one to one relationship between a software product and a software provider, so that the product cannot be adopted (or replaced) without adopting (or replacing) the provider. Yet, cues about the product can greatly differ from cues related to the provider. The following quote provides an example of conflicting messages being extracted about the value of the ERP product on the one hand, and the vendor's pricing practices on the other hand:

> *Every year we upgrade to whatever [version] is out there. In January, they [ERP vendor] upgrade the new tables, so our payroll is done automatically on the computer, our POS is there too, […] it's a wonderful resource! […] Now, if you don't buy, if you don't stay with software assurance, they screw you to death, because the years you catch up are doubled. So if you skip two years you pay double as much, triple for the oldest one, then double and then current, so you could be paying for six years when you're all only gaining three!* (Participant 14)

Faced with conflicting cues, business owners try to disambiguate incoming stimuli by weighing the advantages and disadvantages of both inaction and change, and interpreting as desirable those courses of action where advantages seem to outweigh disadvantages.

Put differently, disambiguation here means that the business owner 'takes sides' amidst cues that may very well be uncertain and remain in contradiction. In another ERP case, the participant explains how a hotel has – for now – weighed the advantages of staying with their ERP as higher than the advantages of switching:

> *The thing with our ERP is that they charge you for everything. You know, any mistake, anything that happens, any support call… you're charged. Their support is very expensive. For example, if we did our online booking through them, they'd charge us $1 – 1.50 per booking done through them, so we're not ... we've tried to look at other ERP systems. The hotel has been on this ERP since 2006, I remember that very well, I was there in that process. So after all this time, moving to a different system for our accounting, inventory, restaurant, booking, POS, you know… everything that's now on the ERP, it'd be very difficult, and everyone is trained now, it'd be like very traumatic. We don't know if it'd actually be more expensive for us to switch or to stay with the one we have, because you know that when you first start having invoices out of your new ERP, you get invoicing mistakes and that's costly, that's a cost for the hotel. But we have had some quotes, companies send quotes and they ask for sales presentations. There was the one we were really interested in, because of the way they handle the system, they give you 24-hour support, and support isn't that expensive, it's beneficial in many ways. So we talked about switching, but we sort of left it there, because we need to assess what is more expensive, whether switching or staying with the one we have.*
> (Participant 20)

In the process of weighing pros and cons, business owners assign substantial weight to consequences that affect them personally, hence coming to judgements that might seem overly cautious. However, caution does not appear excessive if the analyst considers consequences not in absolute terms, but commensurate with the activities and expectations of the person being cautious (Weick et al. 1999). By adjusting the scale in this way, it becomes noticeable that what is at stake can be as high as the continuance of the business. The following data excerpt, concerning a decision between a manual and an automated data migration, is remarkable in this regard:

> *When we transitioned over [to the cloud version of a CRM package], I paid a student to come in and take everything from the old database and add it to the new database. We went into every contact record and printed all information of each and every person. Because when we moved the computers ... if anything happens I'm out of business, so we spent probably a whole week just printing on everybody and keeping it separate and then the student came in and as a summer job we just gave her all that paper, boxes of paper 'take this and put it into our new database'. […] What happened was that the old version wasn't being supported, right? So I couldn't call the company to support me and help me to maintain the data, and my son [a*

software developer] said he could do it, but he couldn't guarantee, 'if anything goes wrong, don't blame me'. And I said well, let's be careful then. So, we just printed it, and we did it the smart way even though it was harder, longer and more expensive, but I still have my business, so I'm quite happy. (Participant 13)

A third way in which cues get disambiguated over time is through formal or informal learning experiences of business owners which help them increase (or simply modify) their own capabilities to interpret cues. That is, the cues themselves may not change, but the individuals' interpretation of them does. Below, a business owner describes how his interpretation of the value of search engine optimization (SEO) changed after he went to a training program about it:

I used to go to tradeshows, and in one of those tradeshows a guy came to me and he tried to talk me into the search engine thing. I never paid attention to him, and there were many like him. A while after that, [name of institution] offered a course for small businesses about websites, and they taught us what the search engine stuff was about, and how to do it, the goal was to train you to do it by yourself. I went to a few sessions, but not all, I couldn't always leave the factory. It was very interesting, they would ask us questions like: what are the products you sell the most? Say it's leather bags, and then they would show us how when you go to the Internet and you type leather bags, you [the company's website] come up, so you could see that could trigger many things…, but you would have to be on top of it, you would have to feed it, and it was a long process. So from last year the thought was in my head, and I now know how that works. I mean, I don't know how to do it, but I know I need it, I know it's very important to have it, […] and I regret I didn't do it sooner. (Participant 18)

The finding that cues undergo a process of disambiguation that affects attention, interpretation and responses is important because it suggests that in small business settings there can be a significant lag between the moment cues first start to appear and the moment cues are attended to, a finding that not only lends support but also helps explain their late adoption of innovations (Rogers 2003).

6.3.2 Definition of Opportunities and Problems

As small business owners wrestle – to varying degrees – with cues, trying to understand what they mean for their business and how to respond to them, they simultaneously define the situation they face as either an opportunity or a problem. In this context,

opportunities can be new business undertakings that the business owner wants to pursue

for which they believe some sort of IT is useful or necessary, or they can be instances of

willing technological adaptation. Typical examples of the former include: starting up a

new business and having a website and a phone line to go with it, engaging with a new

business activity and acquiring the IT infrastructure deemed necessary for adequately

conducting such activity, opening up new markets and establishing e-commerce

capabilities to serve those new markets. Typical examples of the latter are SEO services,

software upgrades and social media presence. Opportunities are fueled by the hope of

producing positive change for the business – and its owner –, as a plastic artist eloquently

describes in her remarks:

> *By evolving from the traditional wet paints, sort of say, and going into the digital media, what that does is I become more than a starving artist, because an artist with traditional wet paint would make a painting, a canvas, and there is only one! And once that's sold, there is no more, you have to make more, which is fine, but it is a truly time consuming way of working, and in our day and age you can't do that. So, it's like photography, digital media has allowed photography to evolve to the point where you can mass-produce, you can sell images on iStock, Flickr, whatever, you sell images per image, but you retain the copyright, and you can generate money from there. It becomes a more steady income if you can have a portfolio that's huge. […] So what it does is that if you make let's say a landscape, and this is an evolution, I mean I started with glass but things go, right? Let's say you want to do a landscape, you do it digitally, you have it on your hard drive, you have it on all your portable drives, you can now put it out there on the Internet and it's global.* (Participant 2)

Defining an opportunity requires both 'awareness knowledge' and some 'how–to

knowledge' about the technology being considered (Rogers 2003). In my sample, those

two types of knowledge are more often present for technologies sitting more comfortably

on the 'consumer' category (e.g., smartphones, social media, mobile apps) than on the

'enterprise' category (e.g., manufacturing software, servers), or within individuals with a

more solid IT knowledge base. This suggests that technologies tilting towards the

consumer side seem to be more readily observable by small businesses as a whole, thus

picked up more widely as opportunities, than technologies outside the consumer

spectrum, which require an individual with a stronger IT knowledge base who can spot them and define them as opportunities.

This finding is not entirely new, but it might take a new spin of particular significance in the context of small businesses: most IT innovation research has suggested that larger quantities of certain innovator characteristics will result in larger quantities of innovation (Fichman 2004), while holding IT attributes as constant. Yet, current trends of consumerization of information technologies would suggest a scenario where dynamic attributes of the innovation (e.g., observability gained via consumerization) can result in larger quantities of innovation, holding innovator characteristics constant (e.g., knowledge).

Problems are situations where cues suggest that expectations of continuity are not being met (Weick 1995) or may soon stop being met. Usually, problems involve failures in the current technological setup that introduce difficulties, thereby diminishing the business owners' ability to adequately run their businesses. As continuity is compromised, it follows that actions are contemplated which might re-establish it. As explained earlier, the cognitive task of considering action usually involves weighing the benefits and costs involved in both action and inaction[5] whilst cues build up. Problems vary in their severity. Big problems are those for which the costs of inaction appear so great that inaction is deemed an untenable option. Costs which participants typically weighed

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[5] I must clarify that throughout this section I use the terms action and inaction very loosely: action refers to responses which would traditionally be captured in the literature as intentions to adopt an IT innovation, or as actual adoption behaviours; inaction refers to responses going in the opposite direction. By referring to responses in the negative as inaction I simply follow the normative beliefs underpinning most IT adoption research, which focuses on IT adoption as the sole behavioural action of interest and subsumes all other actions under non-adoption behaviours, which is practically equivalent to treating non-adoption behavioural actions as inaction. However, my use of the term inaction will shift significantly in the next section, where I discuss in detail the many responses small businesses produce which do not qualify as adoption, yet strongly indicate action. Therein, I only use inaction to mean, explicitly, lack of action.

heavily are those which involve halting or seriously disrupting operations, or upsetting

the customer base. When describing a big problem which both disrupted operations and

affected customers, the owner of a waste removal services company told me:

> *So here's what would happen. It's a Monday morning, [the call centre operators] had the updated version of the database, during the day they book about 20 jobs, the two [call centre] girls, ok? Then they send the file [by email] to the data clerk, he updates all the information from all the drivers, from all the jobs that they've done, he's tired, he sends the wrong version back for Tuesday morning, so Tuesday morning the girls at the call center start taking reservations with the same database that they started on Monday, so what's missing is the 20 jobs that they booked that date, what's missing it's all the entries that he made updating all the records. So now what these girls start taking, they make another 20 reservations throughout the day, however, not realizing they're working on an old version. So at night time when we sent the jobs for the Wednesday, all the jobs that were booked on Monday for Wednesday wouldn't be in that database ... so the drivers wouldn't get the updated information. So let's say on Monday they booked 4 or 5 jobs for Wednesday, so that is missed, because they didn't get the updated database ... and then you have customers that we promised that we were going to show up, customers that we promised that they were going to get the invoice ... so can you imagine all the headaches that we had? It was crazy, it was absolutely insane! It was impossible! [...] When you start dealing with 30 - 35 jobs in a day, you just can't do it anymore.* (Participant 8)

By contrast, smaller problems are those for which the costs or risks involved in inaction

are not high enough (yet) to make action an imperative. For that reason, these problems

can wait, and they usually do. Because smaller problems are usually addressed by means

of workarounds, I will discuss them more fully in the next section, which focuses on

responses.

Problems also include potential problems, where the consequences of failure are not

being experienced, and yet business owners can determine a risk of failure based on

weaker cues, as in the quotation below, about the possibility of experiencing data loss:

> *Right now, the company's information is very spread out across the nine computers we have. Everyone handles their information on their own hard drive. Now that I have a larger team I'm starting to realize that there might be staff turnover, there might be data loss [...]. It hasn't happened yet, but, for example, we get projects where we have to go back to historical records, and our records aren't quite organized, [...] so that and preventing data loss due to staff turnover or whatever has taken priority [...]. The company's records will be much more organized when we get the server, it won't be a file on a flash memory or on an external hard*

drive, like a stand-alone file, or a file on a laptop that might get stolen; the risk of losing information is very high that way. (Participant 15)

To close this sub-section, it is worth reminding the reader that the distinction between opportunities and problems is chiefly analytical (i.e., empirically, some events are defined by business owners dually as opportunities and problems) and that these definitions might emerge gradually over time, and are subject to change over the course of IT encountering processes. Along the way, problems might evolve into opportunities, and opportunities might turn into problems. This happens because the process whereby cues are attended, interpreted and acted upon is continuous, disambiguation of cues is constantly taking place as new cues come in, and cause maps are being updated accordingly. Below is the short story of a customs broker who took advantage of an opportunity, ended up having a big problem upon which he had to act promptly, and the experience led him to refine his "*newer is better*" cause map:

> *I try to go with the latest software, I think that newer is better. But there are limits to that, because I have to use a program, a secure remote, a VPN is called, that I had installed for dealing with the customs agency. So this friend of mine told me 'here, this Windows Vista 64 is better, is newer' so I said 'OK, put it on', and the problem of switching to 64 is that I couldn't log in on to my VPN. It turns out that the customs agency hasn't reached that level yet, and I felt like the program was being erased, like the laptop configuration didn't work, like there was something wrong. So I had to come back down to 32, because there was no point in going higher if the technical requirement was lower. So I had to have my laptop reset to the original. Just as if I got a new car and I tried to switch the engine for a more powerful one, but the car isn't technically engineered for that, then the car won't go. So you're making like an implant, thinking that it'll be a good thing, but it isn't a good thing.* (Participant 19)

6.3.3 Reckoning of Resource Levers and Constraints to Action

In concomitance with disambiguation of cues and definition of opportunities and problems, a third sub-process of attention and interpretation taking place is the reckoning of levers and constraints to action. At the same time that business owners attend to cues suggesting problems or opportunities, they try to figure out suitable courses of action, and

as they do so, they often encounter limitations in their time, money or knowledge which impinge upon the courses of action that are identified and attempted. Less frequently, they recognize that knowledge held by them or by other people within the business might facilitate some degree of transformative action, by diminishing the pressure imposed by money or time constraints. Given that pre-existent resources and capabilities may hinder, but also facilitate, the identification of suitable courses of action, I speak about the reckoning of both levers and constraints to action.

As levers and constraints to action are determined, business owners shape courses of action which can help them either operate within those resource boundaries or creatively circumvent them. It follows that the range of responses they construct will be much broader than the adoption/non-adoption binary set that IT adoption research regularly considers, and less IT-centric than the alternatives usually considered by IT selection and evaluation research. That range of responses, in the richness revealed by my data, is the central topic of the next section.

There is nothing new in the observation that small businesses have fewer resources and capabilities than their larger counterparts, or in the accompanying postulate that individual and organizational actions are affected by the amount of available means (Ashby 1956; Bourgeois 1981; Sarasvathy 2001; Sen 1979). Thus, I will provide a brief characterization of these resource limitations, without going in much detail, and I will only expand the discussion at the end, where I will refer to two aspects of the findings, namely an *etic view of knowledge constraints* and a discussion of *intersectional constraints*, which are probably less obvious and deserve greater elaboration.

To a large extent, *money constraints* emerge from three defining features of small businesses: the business' strong dependence on the owner's financial resources, the tension experienced by the owner between personal and business uses of these resources, and the owner's full autonomy over decisions. Together, these features result in owners feeling that they have less money than they would need to attend to all their business and personal needs, and generally expressing unwillingness to incur in expenses which are not viewed as strictly necessary. Unwillingness to spend money is vividly articulated in comments such as "*like most business owners, I am hard to get to part with my money*" or "*(When) I was in the corporate world, they wanted to roll all the technology out there, and money was no object. Well, money is an object because it's now mine!*" Faced with money constraints, participants tend to give more weight to cost considerations in their decision making processes than they would otherwise, thereby narrowing down the range of courses of action considered; for instance, they might discard some known courses of action which are deemed unaffordable, or some others whose return is uncertain; they might satisfice – i.e., halt search as soon as a reasonably good, arguably sup-optimal, alternative fitting their budget appears –, or they might extend search (thus delay adoption) until such an alternative is found. In the long run, shopping for price may hinder the stability of courses of action pursued, as poor quality attributes of selected alternatives are revealed or cheaper alternatives are found and chosen.

Similarly, *time constraints* are rooted in tensions concerning time allocation for personal and business purposes, and a feeling of dissatisfaction when time allocated to the business takes over personal time. Business owners I interviewed generally feel that running their own business puts high demands on their time, much more than being an

employee; one of them joked "*In your own business you only have to work half day, it doesn't matter which twelve hours you choose*". Time constraints limit the exploration of plausible courses of action, and may lead to initiatives that are not brought to completion because of shifts in priorities.

IT *knowledge constraints* might reduce the quantity and quality of the courses of action considered, as well as the business owner's ability to distinguish among competing courses of action; generally, lack of IT knowledge discourages personal involvement in decision making processes of this sort. Indeed, those who deem themselves not competent enough to make this kind of decisions share a feeling of disempowerment, expressed in the use of language such as "*I'm a fish out of water*", "*with IT they rip you off, they sell you a pig in a poke, and you don't know, they tell you stuff, they trick you out of your money, that's so annoying*" "*they all offer something a little different , I don't know enough about it, but I know I'm not comparing apples to apples*", or "*I don't have a clue, I don't have the technical criteria to say yes or no*".

To be sure, these and several other downsides can be associated with decision making processes which are heavily charged towards saving money or time, or severely constrained by lack of knowledge. Furthermore, participants seem well aware of many of these downsides, and they experience a constant tension trying to move forward with their businesses despite difficulties to do so. They bemoan that the management side of the business takes time and money away from performing the activities that actually generate revenue, expressing with disappointment that "*running a business is out of balance*". Fundamentally, what needs to be understood is that they see the balancing of structural constraints and emerging demands as intrinsic to their small business condition,

thus they judge the appropriateness of their choices against practical compromises, not optimal ideals.

On a brighter note, pre-existent knowledge, when it is available, can act as a lever for action. For example, prior knowledge of a specific software product can be more conducive to adaptive responses because, if cues suggest adaptation is needed, that knowledge will ease up the decision to switch to that product, or to get a version upgrade. Prior knowledge can lower learning curves, time barriers – because no search is considered necessary – and also money barriers – in the case of version upgrades, which have lower prices than new licenses –. The quotation below provides the example of a business owner who changed her business orientation from distribution to manufacturing. Her prior knowledge of manufacturing software enabled her to quickly identify a software product suiting her needs and fitting her budget:

> *When we started manufacturing, in 2007, we knew our accounting package didn't have all the detail we needed for costing. So in 2008 we bought [program A], I knew about it just by talking to customers, many of them had it and were doing well with it. Some of our customers are subsidiaries of multinational corporations, and they have both [well-known ERP software] and [program A], and they find that the reports of [program A] have a lot more detail, so I knew that software was good. And we couldn't afford [well-known ERP software], it was like a hundred thousand dollars vs. fifteen thousand dollars [for program A].* (Participant 25)

An etic view of knowledge constraints

So far I have only introduced constraints participants could readily see and discuss with me, but what about those they cannot fully articulate, and I, as the analyst, notice? Here, I move deliberately from an emic to an etic approach to discuss two knowledge constraints which are latent in the data, but cannot be fully grasped if only the viewpoints of business owners are considered. Yet, they are relevant if one wants to understand the many complexities weaved into the IT encountering experiences of this group of small business

owners. The first of these constraints, and perhaps the most severe one, is related to the

very limited understanding many participants have of the IT marketplace[6]. It is

noteworthy that many of them seemed so unaware or distant from arguably well-

established product and service categories, growing delivery models (e.g., cloud

computing), competing alternatives to dominant software market players (e.g., open

source business applications), and other relevant IT organizing visions (Swanson and

Ramiller 1997). This is revealed by my data analysis in three ways. First, some of them

find it very difficult to recall industry terms, as it was the case for this business owner

attempting to talk about mobile website optimization:

> *Nowadays you have to have a website that … that people can see with … they no longer use the system … there's a new system now, the system … I forget the name, the whatchamacallit, that you can see the website like from your cellphone, so that's what we're doing.* (Participant 18)

Second, some individuals use alternative labels for describing some of the technologies

they use or have been exposed to (e.g., referring to the "*off-site database*" as opposed to a

cloud CRM). Third, they portray imagined scenarios of technologies they 'wished'

existed, not knowing that such technologies do exist. The underlined section of the quote

below vividly describes functionality which is ordinarily associated with well-known IT

product categories such as business intelligence, but was unknown to the person

commenting:

> *We hired a company to develop software that could capture all the data of an oncology syndicated study that we were selling to our customers. The study is about prescriptions, market share, etc. […], the software has some predefined cross-tabs, and charts that are already there. But having software custom-built, sure it has some advantages because you can have some things as you want, but once we had it built, when we were using it we realized*

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[6] I differentiate between limited knowledge about *IT* and limited knowledge about the *IT marketplace*. The former emerged from the emic approach and refers to their perceived lack of knowledge about technical or use aspects of IT. The latter is more specific, as it refers to my identification of a fairly restrained awareness and understanding of the current offering available from the IT industry. Importantly, the former is not necessarily a pre-requisite for the latter, and the latter is arguably more relevant for the kind of decisions studied under an IT encountering approach.

some totals were missing, a variable that was added a little later couldn't be included in the software, […] so… I wish that somehow there were software where you could have like Excel pivot tables built into the software, because everyone knows how to use pivot tables, and how to use filters. (Participant 15)

This lack of knowledge about the IT marketplace is not at all surprising, given the dynamism and complexity of this market and the nature of small businesses. It is, nonetheless, deeply regrettable because it seriously hinders the ability these individuals possess to locate suitable IT alternatives and to take advantage of changes in this market which can be beneficial to them.

The second etic constraint is related to the use of prior knowledge as a lever for action. Some of the advantages of using this knowledge were mentioned above (namely, smaller learning curves, reduced time lags, reduced costs). The risks of using this knowledge are worth noting too. They include competency traps, or path dependencies more generally. Some of these risks are latent in the data, but business owners might not necessarily see them as such. Two variations of this theme can be examined. First, when business owners think they know what alternatives exist, even if their knowledge is inaccurate in practice, their confidence in what they know may prevent them from exploring further, as in the quote below:

Participant 3: *There are several steps to create a fashion collection. First, you do research on trends, colours, fabrics … it's a lot of research, and I do all that through the Internet, I use forecasting services, […] then when you have all the information you start developing your ideas […] and if I'm going to present my finished collection to a company I have to show them my fashion illustrations, which is something like this [showing hand drawn ones] but this is hand-made and for them it has to be digital and professionally printed. That's where I use [Program B] and [Program C]. Having various digital formats helps show the concept I used for creating the collection.*

Interviewer: *Are [people in the industry] open about the software you might use to produce the digital illustrations?*

Participant 3: *They don't really care. I'm only using [Program B] and [Program C].*

Interviewer: *Could you have decided to use other programs for doing the same thing? Are there any other programs that do what [Program B] and [Program C] do?*

Participant 3: *No, I don't think so. Plus those were the programs I used at college.*

Interviewer: *Are those also the programs people use in the industry? Or are there other options?*

Participant 3: *No, those are the programs.*

In the case above, lack of awareness of the many alternatives that exist beyond the specific instances mentioned led to a reduced exploration of alternatives which could have served the same purpose while saving a considerable amount of money.

Second, business owners sometimes give much more weight to the cost of engaging in new learning curves, and to switching costs more generally, than to the risk of being locked into competency traps, where the business preserves procedures with which it has achieved high levels of proficiency, while "keeping experience with a superior procedure inadequate to make it rewarding to use" (Levitt and March, p. 322). I say this risk is latent, because I did not come across any case where the business owner thought they had made 'the wrong choice' in keeping an inferior alternative far too long. In fact, they seem to think they were wise to go with a superior alternative from the start, as this business owner explains:

> *I had the 2005 version [of Program D], and every year they come up with new versions obviously, like all software houses do, and from a certain moment your old files don't work anymore, these companies force you to upgrade. [...] So to your question, I never thought about switching. This is the software we know, the company was set up on that software, and our files are on that software. And you sometimes go back to those files, because they're objects that you design and produce, and maybe no customer orders them in a year, but then we you have to manufacture them again, there might be changes, and you have to go back to the file and open it, so you need the software. We never looked into other alternatives, and we knew there were other products, like [Program E], but we never looked into anything else. [...] I think ours was the right decision because [Program D] is still the market leader, they're still a solid company.* (Participant 29)

It might be the case that business owners attached themselves to a superior alternative at an early stage. My argument is only that, in light of the high dynamism of the IT

marketplace, the market standing of alternatives varies over time, and the risk of being trapped into a formerly superior alternative can always be there.

Intersectional constraints

The most important finding around time, money or knowledge constraints does not lie in acknowledging their existence, but in recognizing their intersectionality. I borrow the term intersectionality from feminist scholarship, where it was first coined by Kimberlé Crenshaw to suggest that the isolated use of either gender or race arguments to explain violence against black women was severely inadequate, because it failed to recognize how such violence is "the product of intersecting patterns of racism and sexism (which) cannot be captured wholly by looking at the race or gender dimensions of those experiences separately" (Crenshaw 1991 p. 1243-1244). Crenshaw then illustrates how, for example, social provisions made available to *women in general* for protecting them against violence were not truly accessible to many *black women specifically*, because of circumstances unrelated to their gender but related to their race, such as poverty, mobility restrictions, or a poor understanding of social services.

Proceeding analogically, I have found that in small businesses time, money and knowledge constraints interact with one another producing intersectional constraints; that is, situations in which the manifestation of one constraint interacts with pre-existing constraining forces to create a distinctly new limitation to action. I will describe and illustrate the three intersectional constraints I identified.

Limited knowledge meets limited money: In the small businesses I studied, IT adoption decisions were frequently made without an adequate understanding around the

complexities involved in making the chosen path work; such complexities include, for example, the risks entailed in systems development or implementation. No wonder, some of these initiatives fail to deliver the expected results, and disappointment follows.

The business owner, limited in their comprehension of the reasons why things went wrong and cautious about their finances, is reluctant to invest money to try again, worried about failing once more. The owner of a quilting business explains:

> *I've talked to other [web developers] to find out about how to upgrade [the website] to make it so that I get the hits and everything, for how much it would cost, it's several thousand dollars and I'm like no. Because I don't know if it actually would work or not, because I've been burnt, so I think I don't really want to put the money in and be burnt again, so it really frustrates me because I was really looking forward to doing that and having [the website], because I know a bunch of quilting places and all they do is they sell their stuff online and they don't have to have the store, they just have all their stuff in their home and they sell everything online, and I know a bunch of friends who […] order everything online, they have it come in to them and they love it, and there's a lot of people who do that, and that's what I was planning on and working on, and I just can't get it to work, so it's very frustrating. Because I'm looking at how much it would cost to upgrade and I'm thinking I'm scared to take that step because of how badly I got burnt already, so it makes it frustrating.* (Participant 6)

Limited knowledge meets limited time: Due to their insufficient understanding of the IT marketplace, it is often the case that small businesses can quickly spot a problem without being able to identify an appropriate solution in a short time frame. To solve the problem, they would need to engage in search, which could be daunting because of their lack of understanding of technology markets, and would take time, which is also a scarce resource. Consequently, they decide to continue living with the problem if the cost of doing so is not too high to bear, as in the situation below faced by a designer:

> *I hate the accounting package we have, I hate it, it's horrendous, the bookkeeper I had recommended it, [and he] left. But I still have the program and I absolutely hate it. It's so complex, it's overly complex, it never gives me the information I want. I used to have a nice little program that my husband had made for me, and I was happy with it, I could find everything, it was very easy. But now it is a disaster, and every time I ask for information I get a humungous list, it just wastes such much paper, it's the most anti-ecological software I've ever seen. If I could, I'd get rid of it tomorrow. But I can't, because I just don't know of any*

good program. And just the thought of switching ... no, no, I don't even want to think about it. It's been a tragedy. (Participant 17)

Two and half years later, when I asked her about this, she told me:

I still have [the problem], it hasn't changed a bit. It's still a disaster, I'm still dissatisfied with it. But I haven't had time, there's been a lot going on, and since I take care of design, I go to see the customers, I manage the company, I do everything, I simply don't have any time left. (Participant 17)

<u>Limited money meets limited time:</u> Even for IT savvy small business owners,

intersectional constraints might complicate technological adaptation. Having limited

funds, individuals with sufficient technical knowledge often feel inclined to create their

own websites and other software solutions – I will discuss do-it-yourself (DIY) as a

response in more detail in the next section –. The catch, though, is that the business

owner becomes their own source of tech support, and time constraints prevent them from

providing themselves with a timely service, which means that easy-to-solve problems

remain unattended longer than they normally would if tech support came from an external

source. A person in the construction business, with a background in programming, faced

a situation where, after putting up a technological infrastructure for his business, could

not find time to maintain it when it failed:

My web server went down, the power went off. It refused to boot up again. It's been that way for a year. And it's not that I didn't want to do anything, I just didn't have time so..., and it's not worth paying somebody for it. It's minimal benefit to cost of having somebody do it when ... I can ... [But] the kids have made things difficult ... I am tired at ten at night, so instead of being able to program from ten until midnight, I am sleeping from ten ...well was, until the newborn. (Participant 4)

To summarize, small businesses faced with ecological change will attend to cues,

interpret the meaning of cues and respond to them based on their cause maps; this

happens in an ongoing cycle whereby all process components (i.e., cues, attention,

interpretation, responses) may change over time in a highly interdependent fashion. As

far as IT encountering is concerned, three sub-processes underpinning attention and

interpretation which deserve special consideration are *disambiguation of cues*, *definition of opportunities and problems* and *reckoning of levers and constraints to action*. The first one is the model's interpretative engine, which keeps the process spinning. The second and third ones are the two most typical components presupposed in any decision or problem-solving task: the issue upon which one shall act (here, problems or opportunities), and the parameters to be considered for action (here, resource levers and constraints to action). Now, it is time for motion: how do small businesses respond to the issues they frame as they do, given the action parameters they set for themselves? I will discuss this question next.

6.4 Responses

Responses are the behaviours carried out by business owners in reaction to their evolving understanding of both the situation they are going through and the resources they have – or lack – to address it. As argued earlier, responses feed back into attention, interpretation and stored cause maps, as they might alter the situation, thereby generating new cues which individuals might notice and interpret again. For that reason, in the model responses are not final; they are better understood as temporally-bounded attempts to act upon a situation. Similarly, several responses can be operating simultaneously. In analytical terms, what distinguishes one response from all others is not its timing, but at least one notoriously distinct content-related dimension of the behaviour.

I identified a wide range of responses constructed by business owners during IT encounters. Figure 5 above provides a graphical depiction of my findings around responses. As shown therein, responses occur within cycles, and cycles group together responses which share a fundamentally similar attitude towards relatively large IT change

(i.e., the magnitude of change implied in usual scenarios of interest in IT adoption research, such as taking up e-commerce technologies). Engaging cycles group favourable responses towards IT change, and shunning cycles group unfavourable responses towards IT change. As new cues become available and are interpreted, attitudes might change from favourable to unfavourable or vice versa, those changes are called tipping points. When attitudes shift from unfavourable to favourable, an engaging cycle follows; there are no analytically important differences between pre-tipping point and post-tipping point engaging cycles. When attitudes shift from favourable to unfavourable, a disengaging cycle follows; responses within disengaging cycles differ from those found during shunning cycles, hence the variation in terminology.

The closure point of a cycle is an outcome, which represents the decision made as far as the relatively large IT change is concerned (i.e., adoption / non-adoption, switch / non-switch, continuance / abandonment). Given the nature of the data and the spirit of the analysis, the occurrence of outcomes is not necessarily orthogonal, at the end of a cycle two outcomes might overlap. As an illustration, let us imagine a business which used to have 10 licences of a software product, and scaled its use down to 1 license: such an outcome contains elements of both continuance (the 1 license left) and abandonment (the 9 licenses dropped). Similar situations with overlapping outcomes were frequent after disengaging cycles. Just as responses and cycles are temporary, so are outcomes; they vary with the progression of cycles. Outcomes are underdeveloped in the model in its current form. For now, they are primarily mentioned in the model as a means to connect more easily with prior literature, which has focused so much on them. Thus, while the

discussion that follows will cover outcomes, the main focus will be on cycles, responses and tipping points.

6.4.1 Shunning Cycles

Shunning cycles group responses whereby business owners try to prevent IT changes of a considerable scope from happening. The Oxford Dictionary defines shunning as *persistently avoiding, ignoring, or rejecting (someone or something) through antipathy or caution*. My use of the word shunning for describing these cycles aims to retain a significant portion of such definition, namely the actions of avoiding and rejecting, persistency as a qualifier of these actions, and caution as a rationale behind these actions[7].

Shunning cycles are strongly connected with situations defined as problems which need to be addressed under resource constraints. During shunning cycles, the business owner aims to strike a balance between two competing demands: the demand for a solution to the problem, and the demand for cautiousness in the use of limited resources, especially money. Importantly, even though some degree of change is deemed necessary to solve the problem, the benefits of large-scale IT change are considered low or uncertain, or its costs are considered excessively high. Therefore, the business owner is inclined to limit the extent of IT change so as to keep resource consumption low, even when doing so may reduce the quality of the solution obtained. Appropriate responses are those which deliver small IT changes and deliberately shun large IT changes. These responses appear spontaneous and 'easy', but arriving at them is not necessarily without difficulty, especially because very often small business owners have to confront their own

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[7] Antipathy was present in some empirical instances too, but it does not seem to be an important motivator of shunning cycles.

normative assumptions, or external normative pressures, regarding the more substantial

changes they should strive for. The following words by a professional event planner

illustrate the inner struggle behind her shunning efforts around putting up a website:

> *As a marketing specialist, I'd like to have a website and I'd like people to be able to place orders online, I'd love to have a bunch of advanced stuff on it, but back then I didn't have the money to do that, […] it's like the business cards I had, they were old but I just had so many of them, than the thought of losing them was just …! I spent money on them, I felt I had to use them. I had struck my old phone number through and had written the new one on top by hand. I knew it didn't look good! I mean, me, a marketing specialist, an event planning specialist doing that …. It was so embarrassing! […] That's when I started to work on designing a logo, on writing the content, but then something always came up and I had to put it off for next week, for next month and so forth.* (Participant 28)

Shunning cycles do not entail inertia. After all, a small degree of change is viewed as

necessary to solve the problem. Three active responses I group within shunning cycles

are tinkering, stretching and making do. To the extent that a shunning cycle involves

change, tinkering is always present; tinkering defines the scope of change. Conversely,

stretching and making do operate in a mutually exclusive fashion. I will describe each of

them below.

Tinkering

Tinkering responses introduce small changes to the problem situation in order to improve

it, leaving the core of the initial IT set-up unchanged. The introduced changes are known

to be suboptimal, they are understood as workarounds. These changes are small insomuch

as they are not costly, and usually they do not involve significant effort either. Typical

tinkering responses include memory or processor upgrades done to hardware in order to

extend its lifespan and avoid expensive purchases, as in the following quote:

> *[Once we upgraded our software], we had as much more memory put on [the workstation] as we could, and we upgraded the processor too. We didn't want to buy a new workstation, because the computers that can run 3D design software are the most expensive there are. Those machines have to have super processors, a video card, a super-duper hard drive, so*

those workstations are about $2000-2,500. So we tried to work with the one we already had, and we managed to do it [...] (Participant 29)

Business owners realize that by tinkering with their IT they might only be buying time; they might know from the start, or get to notice quickly, that the larger change may be delayed for a while, but perhaps not indefinitely. Tinkering responses are worthwhile if they solve an important aspect of the problem, for as long as they solve it. When they do not, the business owner is pressed to try out a different response. The quote above continued as follows:

[...] but the machine was still very slow, so we ended up buying another workstation. (Participant 29)

Stretching

Stretching responses intend to obtain the most value out of the small changes introduced. In carrying out stretching responses, the business owner makes minor additions to their current IT set-up attempting to arrive, as closely as possible, at the result that would be obtained if a larger change was introduced. Additions are minor in the sense that they require very little consumption of resources. The owner of the quilting business explained how she stretched the functionality of her point of sale technology by adding a small calculator to her IT set-up:

A cash register is a cash register right? [Laughs]. [Mine] doesn't do things, like I can't put things like 0.5 or whatever so I have a calculator beside it and go like 0.5 at 15.15 a meter equals... and then I can put that amount in. But [when the cash register was bought], it doesn't tell you that for the whole description, it tells you OK it does all these things and for setting up for the taxes and it does all the figuring out and you think that's great and then you had to go into quite a bit more money to have one that did all the other stuff. The calculator cost me two bucks, I can push the numbers in, instead of spending like $500 or $600 more for one that can take the partials. But those are things you don't know about until you get into it. (Participant 6)

Making do

In contrast to stretching responses, making do responses discard the addition of new elements to the technological set-up, no matter how small such additions might be. In making do responses, the (self-determined) rules of the game are for business owners to work strictly with resources they already have so as to alleviate, as much as possible, the negative consequences produced by the emerging problem. An insurance broker decided to make do with the read-only license he received for free with his CRM software package, rather than getting a second license:

> *I have one license which goes to [name of personal assistant], and I get a read-only. I can't change anything, but I can read only, so if I talk to you, and we make a date, I have to send [name of personal assistant] an e-mail and tell her, who you are and the date that we made, when and where, and then she updates the calendar. If I wanted to have two licenses I'd have to pay double, but the read-only is free, so she gets the license and I can just read only. That doesn't cost any extra, so now I can look at my calendar and see what I've got going on. Or I can check out your contact page and then I can see your phone number, at home and at work, and if I need to call you I can get on the phone and call you. So I can see all my information, I just can't change anything, I have to tell [name of personal assistant], so she can update the database.* (Participant 13)

But due to technical problems, access to the read-only sometimes fails, and then he makes do with printouts produced by her assistant. He showed me one and told me:

> *I'll show you. [name of personal assistant] has got the main database, she prints this and I know who I have to phone. Phone calls are over here and people I have to see are over here. I'd still like to have [the read-only] fixed so she doesn't have to waste her time printing this out, I could look on it once a day and I could … you see, what I don't have is if I decide I want to call you to review your insurance, I can go on [the read-only] and I can see where's your phone number and then I give you a call. I can't do that here [showing printout], I have to ask [name of personal assistant].* (Participant 13)

Summing up, tinkering, stretching and making do responses are attempts to solve a problem as much as possible with as little as possible. It is clear for everybody that the problem is not entirely solved, but as long as the resulting situation is not in itself a big problem, the outcome that these responses produce is likely to stabilize. This scenario is

equivalent to a continuous non-adoption decision. The comments below, by the owner of

a leather manufacturing company, illustrate a non-adoption outcome which did not

change in the two and half years spanned between the two times of data collection:

> At time 1: *I sort of 'have' [name of software program]. A lot of companies send me their designs and I have to convert them to [name of software program]. The company that does my clichés, they ask me to send the designs as [name of software program] files, so I have to do that. But I don't know how to use that program, and I won't buy it until I learn it well. So what I do is I pay a young man who has it and knows how to use it, and he does that for me.* (Participant 18)

> At time 2: *I still have the problem [...] What happens, unfortunately, is that I haven't made the effort to solve that problem, because I can go over to my neighbor's, or I just go to a small shop nearby, and the guys solve the problem for me. It's not a serious problem, I just pay like $5 [each time] and I'm done, I get rid of the problem.* (Participant 18)

By contrast, when the resulting situation is viewed as a big problem – because the

solution is fairly limited and brings about its own set of complications, or new cues

suggest the problem is bigger than it appeared to be when the shunning cycle began –

there tends to be a tipping point, from a shunning cycle to an engaging cycle. Tipping

points will be described in more detail later in this chapter.

6.4.2 Engaging Cycles

Engaging cycles group responses whereby business owners try to introduce IT changes of

a considerably larger scope. That is, changes more readily comparable to the ones usually

studied in the small business IT adoption literature (please refer to Table1 for a list of

technologies considered in those studies), or in the IT selection and evaluation literature.

These changes are not necessarily large in absolute terms. Empirical instances include

such innovations as smartphones, or subscription to low-cost e-commerce platforms. Yet,

they are larger in relative terms, compared to their 'shunning' alternatives (e.g., having

the flip phone fixed, or doing international sales via traditional money transfers). In other

words, changes associated with engaging cycles are those whose scope lives up to the prevalent normative expectations around IT innovation.

Engaging cycles can evolve out of situations defined as either problems or opportunities. Whichever the case, the business owner defines an issue upon which they need to act, and recognizes resource constraints which limit their room for action, and again needs to balance the competing demands this situation creates. What differs, though, is that the individual chooses to prioritize the need to address the issue over considerations about resource constraints. Often, but not always, the reason behind engaging cycles is a big problem, as defined earlier in this chapter.

Given the money and knowledge constraints small business owners face, opting for a larger change does not mean that the person knows what such a change could look like, what alternatives exist, and which of those alternatives better fits their needs and budget. Therefore, engaging cycles are not adoption cycles, they are exploratory cycles whereby the business owner seeks to develop and try out seemingly sensible courses of action. In the majority of cases, developing these courses of action requires knowledge building. But this is not always so; in other cases, plausible courses of action emerge solely from the knowledge the person already has, or from knowledge that is borrowed from somebody else without being internalized. This partly explains the variability I found in the duration of these cycles across events: if knowledge that might work is readily available, the engaging cycle is very short, practically invisible empirically, and the decision to adopt, switch or upgrade is done almost immediately; if, conversely, such knowledge is not available, the engaging cycle will take some time, enough for relevant knowledge to be acquired. Although very short cycles, levered by pre-existent

knowledge, appear closer to the normative expectation of getting small businesses to

adopt IT sooner rather than later, they have some downsides which were raised earlier,

when I discussed knowledge as both a lever and a constraint to action. Similarly, longer

cycles might be worthwhile if they involve knowledge building. A comment from a

business owner who wanted to explore change alternatives very carefully speaks to this

possibility:

> *It's really challenging to get good direction on where you should go and where to learn on this, because everybody's got their own pitch on what you need, right? And it's not always good for you. It's a minefield! So we're going to take our time, we're going to dot our I's and cross our T's to make sure we get the right system.* (Participant 11)

To reiterate, engaging cycles might or might not lead to the large change they are

concerned with, their most salient feature is the construction of the courses of action

which would then lead to adoption or switching outcomes. Five active responses that I

group within engaging cycles are search, experimentation, boundary spanning, DIY and

screening. I will describe each of them below. As stated earlier in this section, each

response is presented as distinct from the rest if it corresponds to a behaviour which

possesses at least one notoriously distinct characteristic. Empirically, two or more

responses can and do occur simultaneously.

Search

The behavioural tradition in management scholarship traces an analytical distinction

between cognitive and experiential modes of search. The former is primarily based on

pre-existent mental schemata which capture selected portions of the environment and

store them as simplified causal relationships. Such prior understanding of causal

relationships shapes search efforts by enabling the making of predictions about potential

outcomes of various alternatives before any of them is undertaken. The latter does not start from prior cognitive models, but from experiences that the organization goes through, whose outcomes are interpreted as they occur. Therefore, under an experiential mode of search, it is not the ex-ante estimation of consequences that guides ongoing search efforts, but the evaluation of actual outcomes (Gavetti and Levinthal 2000). In my model, search responses refer to a cognitive mode of search, and experimentation responses refer to an experiential mode of search.

My findings about search responses carried out by small business owners are largely consistent with the description of problemistic search, as conceived by behavioural studies of decision making: search is not conducted regularly but prompted by issues needing a solution, it continues until a satisficing solution is found, it does not go far from either the problem symptoms or the current way of addressing the situation, and it is affected by the decision maker's cause map and expectations (Cyert and March 1963). What constituted a satisficing solution differed greatly across participants. In general, business owners with more experience with IT and the IT marketplace would be more willing to settle for a good-enough alternative than business owners with less experience, which perhaps held less realistic expectations about IT solutions. To illustrate, below are the comments from a less experienced business owner who 'wanted all' from his new software, and a more experienced business owner, who was more ready to accept a less ideal software solution:

> Less experienced individual: *We've had two software packages for a long time, one is for phonetic analytics in the area of intellectual property, the other one is admin software, and three years ago we started to build our own software where we want to have both things in a single software, and link it to invoicing and accounting, so that we have a single system for absolutely everything. We decided to do that because we couldn't find a software product that fully accommodates all the needs of our firm. We looked at several products, they were*

general for law firms, of for intellectual property firms, but they didn't cover the specific needs of our firm, because we have some particularities that most other offices don't. So we could have ended up buying a software product that was expensive, which would optimize some things but wouldn't integrate all our work. Outsourcing that development would be very expensive, so we went in-house, and we've been developing the software that way. (Participant 24)

More experienced individual: *I'm sure I could find a way better solution if I was looking to spend a couple of thousand dollars on implementation, but I'm not, so I make do with [name of software program], I mean, don't get me wrong, they are great company, but it still probably does 70-80 percent of what I need, so 20-30 percent of what I need is being left off the table right now.* (Participant 12)

Further, literature in marketing distinguishes depth and breadth as two relevant dimensions of search behaviours. Breadth refers to the amount of alternatives or sources of information examined, and depth refers to the thoroughness within which each alternative or source of information is examined; in quantitative research designs breadth is measured as the number of alternatives / sources a consumer looks at, whereas depth is measured by the amount of time a consumer spends looking at each of them (Bettman et al. 1990; Huang et al. 2009). One of the reasons why these dimensions are important is that they help researchers obtain more granularity in their understanding of how consumers search for different types of goods, namely search and experience goods (Nelson 1970; Nelson 1974). In particular, marketing researchers have found that the examination of *search goods* (i.e., goods whose quality attributes are relatively easy to determine before purchase) involves higher breadth and lower depth, whereas the examination of *experience goods* (i.e., goods whose quality attributes are harder to know before purchase) involves greater depth and lower breadth (Huang et al. 2009). My data are consistent with this finding. More specifically, when the business owner defines the situation or the constraints around it in a way that makes search attributes a crucial component of a suitable solution, they will tend to engage in broad search processes. A typical search attribute is price, others are standardized features of well-defined product

categories, such as RAM or processor in a computer, or doubled-sided printing in a

printer. Below is an example of a broad search response driven by price and other

standardized features in voice over IP (VoIP) services:

> *I did a lot of research to try to find the appropriate provider, at the place I worked at before I actually worked on a project of getting VoIP installed for long distance and international calling, [...] and then I used that knowledge to apply to this situation, I did a search on all the IP providers in Canada, or as many as I could find, but there's so many of them! And they all offer different packages and different levels of service, and then either they had no information on their website, so I had to e-mail them, or [what they offered] wasn't what we needed or wanted, so we had to move on to the next one. I had a spreadsheet with a list of probably 15 or so that I compared all the packages. I eventually found one based in BC that had all the features that we needed and a few more that we didn't need but were nice to have. [...]. The ones that we needed was that we could share between two computers, and that we could use a soft phone of course, because there are some that don't offer a soft phone, it's like you're using voice over IP, but you use it through your computer, [...] the price was important, because some of them wanted $50 a month, and the one we ended up was something around $22 - $23 a month, and then there was calling locations as well, some of them it was worldwide calling basically, ours I think is North America and Europe, we never call Europe, but we call the States sometimes, so that was helpful, and we get 500 minutes a month, [...], so it's a very good deal.* (Participant 1)

Conversely, when the business owner defines the situation or the constraints around it in

a way that gives more weight to the experience attributes of a suitable solution, they will

tend to engage in narrower but deeper search processes. A good example of an experience

attribute is interoperability: determining the extent to which two systems can easily

exchange information cannot be truly determined only by reading technical specs, it

requires deeper information, which can be obtained by having real or simulated first-hand

experience with the product, or by learning from (trusted) others who have had such

experiences. The same business owner, faced with a different decisional context where

interoperability was thought to be particularly important explained his deep search

response in these terms:

> *I was looking at BlackBerry phones, I was looking at iPhones, but I decided to go with the Android [...] because it's based on Google, you can upgrade it for free, it has a larger screen on it than the iPhone or the BlackBerry, and I watched a couple of comparison videos online, and they all pretty much convinced me. You know, they were impartial videos, but they all*

came out saying that the Android was superior for whatever reasons. It's not as good as others for certain speed tests, but in general it was better than the other two for the features that mattered to me [...], like you can [get data from Google Apps] on Apple or on BlackBerry, but not as easily. I mean, [Google Apps] is right into the Android, so all I have to do is click calendar, and my calendar comes up. And contacts synchronization as well, [...] when you synchronize your e-mail, you synchronize all your contacts as well, so if I go on my phone if I need to find a customer or another business contact, all I have to do is search their name, or scroll through and find the name, and I've got their e-mail, I've got their phone, their address, everything is in there. (Participant 1)

In light of the multidimensionality of the product offering available in the IT marketplace (e.g., multiple platforms, many vendors, overlapping product categories, various licensing types and delivery modes), and the very limited knowledge so many business owners have about this marketplace – as discussed earlier –, a relevant question is related to how business owners narrow down the search space so as to make deep search possible. Put differently: how do business owners manage to give focus to their search efforts when they do not know much about where the experiences attributes of interest can be found in the first place? Most often, they engage in boundary spanning to get their search started. I treat boundary spanning as a response different from search, so I will go back to that discussion later in this chapter. I identified, however, two search strategies followed by some participants to help them focus their own search efforts despite limited knowledge. These are the *use of quality proxies* and the *scaffolding of new searches* on top of initial search results.

The strategy of using quality proxies consists in narrowing down the search space, right from the start, to only include values of an IT dimension which are associated with sought quality attributes, or to exclude the opposite values. For example, business owners may deliberately include or exclude certain hardware or software brands from their search –"*when it comes to the quality, I will never buy a (brand A) computer*", or "*I've*

either had (brand B) or (brand C) laptops, and I've never had any problems with them"–, or they might concentrate their search efforts on packaged software as opposed to custom software – "*we're looking to stay off-the-shelf*".

By the image of scaffolding of new searches on top of initial search results, I am trying to depict the cumulative process whereby some individuals, carrying out online searches, come to identify search terms which get them closer to IT alternatives they find suitable. Such terms are not known when the search begins, they emerge and get refined as the search progresses, as described in the following comment:

> *I was looking for a solution for our business day-to-day activity, so I was typing things like database, online database, you know? Because I wasn't even aware of the term [PaaS], and then you find one company that offers one service and then you start looking at the terms, what they call it, and then you start googling those terms, [terms like] software as a service, and then you get into cloud, cloud solutions, and then PaaS, that was something that came out in the end.* (Participant 8)

Experimentation

As mentioned above, experimentation responses correspond to a specific kind of problemistic search behaviours whereby business owners provide themselves with first-hand experience about an alternative, evaluate the results of that experience, and let that exercise inform their decision making process. In other words, experimentation is an experiential learning route towards decision making. Among participants, experimentation responses are common when prior knowledge of alternatives is limited, and the interest centres on its experience attributes. Because such attributes need to be experienced in order to be known (Nelson 1970), experimentation is a logical response for building knowledge about the alternative.

Importantly, experimentation responses entail limiting the commitment to the

experienced alternative so as to avoid risks that could result from the change implied in

taking up the alternative more fully. Setting boundaries around the level of commitment

to an alternative involves, primarily, an attitude of being ready to discard the alternative if

signs suggest important quality attributes of it do not suit the business needs adequately.

It follows that limited commitment to an alternative goes together with, but is not defined

by, a small expense. A typical experimentation response limiting the exposure of the

business to the alternative being tried out is presented below:

> *What we've done is, we have two companies here, one is [Big Company] and the other one is [Small Company]. We put [Small Company] on [name of software package] because that has a manufacturing feature, we've only been on it for six months, so far so good, we like what we see, we are testing that to see how it goes on a smaller environment, [we want] to see if that's where we want to go with [Big Company]. (…) We're now going to introduce our first product that we decorate in that module, so we'll see how that rolls up and build, and if it works and we can get a handle on it we're good, but if it doesn't, we're not too deep that we can't get out of it. It cost us a few hundred dollars, big deal! But we now know what we didn't.* (Participant 11)

Vendor-provided free trials come in handy when business owners are considering or

willing to engage in an experimentation response, because these individuals are

simultaneously trying to keep their experimentation expenses low. These free trials are

generally well received, but they are not the only means used by business owners to try

out an alternative they develop an interest for. Alternatively, business owners create their

own 'labs', by setting up smaller, semi-isolated environments where they can learn about

the experience attributes of an alternative without putting their businesses at significant

risk. Several business owners, tired of large phone bills but unsure of the quality

attributes of VoIP, have tried VoIP at their homes or somewhat on the margins of their

main practices, before considering its full adoption:

"So I finally decided I would try (VoIP), but initially I didn't cancel the normal phone lines, I sort of did VoIP on the side to see if it worked, and when I saw that it did work, I decided to cancel the other phone lines and only keep VoIP. (Participant 27)

As noted, experimentation in the model is construed as a specific kind of problemistic search. This implies that experimentation is also satisficing, it is based on trial and error, it proceeds so as to discard alternatives that do not work when they are tried, until one is tried that works. The next comment about a business owner trying out different backup alternatives until a reasonably good one was found illustrates this point:

I first tried the wireless backup, it was a network hard drive. It didn't work, the performance just wasn't there, the machine became very slow when I was backing up, and I had to back up four machines in two or three terabytes. It didn't work, I discarded it totally. Then what I did was, I used portable hard drives, because I happened to have a couple of hard drives of one terabyte each, and I discovered that the problem was that obviously the portable hard drive had to be plugged to the machine all day, and those portable hard drives aren't supposed to be used that way. So before anything else happened, I started doing some research on the advantages of a desktop external hard drive versus a portable external hard drive, and I realized that I had to use the desktop one, […] I also thought about doing it on the cloud (…), but the cost for what I needed, it wasn't worth it, so I went for the desktop external hard drive, and I set it up so that every day it automatically runs a full backup of all my machines. (Participant 10)

Boundary spanning

Boundary spanning responses are those where business owners attend to interpretations and suggestions coming from individuals outside the business, or actively reach out to these individuals for advice regarding courses of action which may be followed. These responses are often used in combination with other responses, to spearhead experimentation and search efforts, and avoid missteps therein.

It has long been known that gathering information from outside the firm is a key component of innovation processes. External sources can bring market, technical and know-how information that the firm needs to become aware of new products and ideas and to learn about methods and rules for introducing them and implementing them (e.g.,

Tushman 1977; Wang and Ramiller 2009). The literatures on trust and social networks also acknowledge that embedded ties across firms promote cross-firm knowledge sharing, are conducive to time efficiencies in various kinds of transactions, and influence how search is conducted (i.e., firms favour deeper searches within embedded relationships over broader market searches) (Adler 2001; McEvily et al. 2003; Uzzi 1997; Uzzi and Lancaster 2003). My findings are largely consistent with these views about boundary spanning, social embeddedness and the role of trust. They are also in agreement with research in economics and marketing suggesting that recommendations of others are more relevant for experience attributes than for search attributes (Huang et al. 2009; Nelson 1970).

A noteworthy facet of the findings which seems specific to my problem domain is the rationale upon which business owners sometimes allow individuals in their personal network to intervene deeply into their decision making processes. External intervention can go as deep as substituting the business owner's own efforts and judgement for those supplied by the external source. This is particularly the case when business owners believe they do not have the required foundational knowledge to evaluate on their own the results of their search or experimentation. A participant described how he located his website development company:

> *They were a married couple, she was a young girl, about 28 – 29 years old, and she had had breast cancer, and she was a part of the team my wife is on, my wife had breast cancer too, and they were in a Dragon boat racing team together. And she was good at what she did, so I just called them, I said come talk to me. So they did, and [they developed] the whole set up.*
> (Participant 13)

When I probed for details about search and evaluation of alternatives, he told me that he had not looked for any other companies, and he had not asked for a quote from this company. He justified it in the following terms:

> *I just trusted them. I didn't have a clue about the price. And if I had gotten a price, they would have all talked a language that I wouldn't understand, so I just trusted somebody.* (Participant 13)

What is worrying about this arguably excessive reliance on boundary spanning is that valuable learning opportunities are missed. Business owners surely get the fish, but they do not learn how to catch fish. In this respect, these responses bring to mind Swanson and Ramiller's (2004) description of the mindless innovator who "seeks simply to attach itself (to) what the broader community appears to know" (p. 564). Yet, these responses also differ from the mindless ideal type, in that they seem to be rooted in deep-seated knowledge constraints to action, and not in attention deferral, contextual insensitivity or institutional pre-emption, as these authors suggest. I would argue that, despite their drawbacks, these extreme responses might be more sensible than they appear at first sight, and construing them as mindless would miss some of the nuances characteristic of severely resource constraints environments. Here is another comment from the same business owner which speaks directly to this discussion:

> *[Understanding the IT market] just takes a lot of time. You have to figure it all yourself, because it is not easily set up, so I can't say 'I've got three questions, here's the three things that are important, and then narrow it down real quickly'. I have to spend an hour, or two, or maybe more to analyze it and understand it and then make choices, and I don't have the time for every decision I need to make. I don't have a whole week to dedicate to just making decisions and researching those decisions, so that's why I deal with people that I trust. So I say I need this, this, and this, do you have something? 'Yes I do'. Let's do it. And I get it done in 15 minutes.* (Participant 13)

The over reliance on knowledge from the individual's personal network found in some empirical events contrasts sharply with the purposeful dispensability of this network identified in a few other empirical events, where similarly knowledge-constrained

individuals are also trying to find their way around intricate problems and unfamiliar

solution spaces. A participant who decided not to get advice from his peer network

explained:

> *The downside is our businesses are all different, so you've got a guy like myself that does licensed products for retail, while he imports, he doesn't decorate or build, so he doesn't do the manufacturing portion, the scalability of his business is half ours, so he's happy with just general technology, you've got other guys that are printing T-shirts, so they've got complexity of designs and inventory or whatever, but it's not set up for the retail side, so it's kind of we are all snowflakes, we are all different, even though we have common goals in mind, and common customers and common licenses, everybody behind that is completely different.*
> (Participant 11)

Future research could explore in more detail some of the origins and consequences of

these different advice-seeking views and practices.

DIY

As the name indicates, DIY are responses where business owners who have technical

competences in IT (or close access to them by means of their staff) choose to create an IT

solution by themselves, rather than using products or services available from the market.

DIY responses can be conceived as a special case of problemistic search: they are issue-

driven reactions which follow a satisficing rationale and do not go far from courses of

action the business owner is familiar with. Likewise, these responses are strongly shaped

by the cause map business owners have formed around similar situations as a result of

their training and prior experiences. What sets DIY responses apart from the rest of

search responses is that actual search of alternatives hardly takes place. Actual search can

be truncated at a very early stage, or it might never happen. This is so because business

owners develop an understanding of both the situation and their own levers and

constraints to action which leads them to conclude very quickly that market alternatives

will not fit their needs or their budgets, and that they have enough technical knowledge to

deal with the issue by themselves. Typically, the DIY route is used for such technologies as websites and software of low complexity, as in the following example, from somebody in the construction industry with an IT college degree:

> *There have been no major [IT] purchases, I just needed to be able to run a spreadsheet program, a database, I created a database just to keep track of prices of materials at that particular time, I was really good at [name of database management system], that was my knowledge base. And I also did my own website, I run my own server in my own basement. So having my own computer experience I don't need to outsource it, I'm kind of self-contained that way.* (Participant 4)

In their insourcing nature, DIY responses resemble in-house software development projects carried out by many larger businesses. Conventional knowledge about in-house vs. contracted-out software development decisions suggests that developing custom software is a very expensive, complex and risky endeavour (c.f. Brooks 1987), hence the in-house alternative should be reserved for critical or strategic projects, and the contracting-out alternative should be preferred in all other cases to take advantage of expertise and cost efficiencies delivered by external development teams. Albeit sensible, this logic seems at odds with my data. Neither the rationale behind DIY responses seems strategic, nor DIY-ers appear worried about the costs of in-house software development. This, of course, is partly explained by the low complexity of the IT solutions which are developed through DIY (i.e., mostly websites). Beyond the technology, potential explanations for DIY responses in a small business context are notorious differences vis-à-vis larger businesses regarding sources of costs and risks in software development. First, in larger businesses the time of the programmers is treated as a cost, in small businesses it is not. DIY-ers tend to program in their spare time and do not charge their businesses for their programming work. Second, in larger businesses software problems and software solutions are not co-located: business units provide problems and IT units

provide solutions, which results in the well-known risk of poor communication between business and IT units. In the businesses where DIY was carried out as a response, software problems and software solutions were co-located, they resided in the same person or group. Therefore, the risk of contracting out software development was perceived as actually higher than the risk of keeping it in-house. Asked about his thoughts about contracting out software development, the same participant replied:

> *Better me than somebody else. Mostly (other people) know what they're doing but I just find they don't pay enough attention to … It's a communication …. It's mostly probably my fault because I'm not the world's best communicator. I just find [software development] can miss its mark relatively easy. You have to have so many meetings, and so many … because I was that person, and it takes a long time to get where you want to be.* (Participant 4)

Screening

Screening responses are patterns of habitual actions[8] carried out by some business owners to deal with unsolicited offers from IT providers. In my data, screening responses are greatly polarized into two sets: the first and largest set of rejecting responses, reflected in such comments as "*That's junk mail. I don't read it, I don't care, I have no impression, I just ignore it*", and the second set demonstrating a discriminating use of these offers on an as-needed basis. Here, I focus only on the latter set, as it is the one that connects with the spirit of engaging cycles.

In contrast to all other responses introduced thus far, which are triggered by an issue facing the business owner, screening responses tend to have a more regular nature. Nevertheless, they still fit into my definition of responses, because these habitual actions

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[8] My understanding of screening responses is informed by Feldman and Pentland's (2003) definition of organizational routines as repetitive, recognizable patterns of interdependent actions, involving multiple actors. However, I could only pinpoint instances of repetitive patterns carried out by individuals acting independently. Therefore, I prefer to speak of habitual actions rather than routines.

have evolved into a pattern in reaction to frequently encountered situations which receive

similar interpretations. This regularity permits the emergence of a more stable response.

Perhaps the most conspicuous feature of screening responses is the intention to be open to

market information that might prove valuable later on. One important reason why this

information can be valuable is the instability of some informal IT providers, such as

freelance programmers, who can be available for a job the first time, but not the second

time around. Thus, it becomes important to keep handy a list of 'IT guys' the business

owner can contact as needed. Another distinct feature of these responses is the use of a

set of procedures and criteria to narrow down the number of providers to be contacted if

the need arises. Such procedures and criteria will vary from one business owner to

another, on the basis of their experiences and accumulated knowledge, hence these

procedures and criteria will evolve gradually over time. A participant described his

screening responses in these terms:

> *Every time I get an offer, I have a folder, and send it all to the folder. I name my folder 'important'. I always file stuff, everything, because you don't know. One day I needed to update my website and I couldn't get a hold of the guy, I never saw him again. So when I have a need, I go to my folder and look for people who offer that. I call like three or four, I do the same with hosting. I see who offers a better price, and who offers better websites, like prettier websites, more creative stuff. They must show me which websites they've done.* (Participant 18)

Two and half years later he offered very much the same description, but added:

> *I now also ask them how much they've been in business, they say three years, so I say well, it might work. But I don't know, they come here and then I can't get a hold of them!* (Participant 18)

My key objective in noting screening responses is not to describe them in detail –

additional, more focused data would be needed for that purpose –, but to draw attention to

their distinctive function in engaging cycles: they help business owners strike a balance

between two extreme and possibly unhelpful behaviours: getting rid of all offers they

receive as if they were useless, or relying on them indiscriminately as sources of market information.

To sum up, search, experimentation, boundary spanning, DIY and screening responses are attempts to engage with relatively large IT changes, despite perceived constraints to do so. This is why these responses are grouped within engaging cycles, and are contrasted with responses clustered in shunning cycles (i.e., tinkering, stretching and making do), in which action emphasizes constraints over the scale of expected change. In my data, the most common outcome of engaging cycles is the execution of the larger IT change with which the cycle is concerned. This outcome is equivalent to an adoption or a switch decision. The business owner is likely to maintain its commitment to new technology and even increase it over time, unless a new IT encountering cycle disrupts stability. Stabilized technologies can also become the foundation for nested engaging cycles, through which business owners set out to explore new changes which might replace or refine their current IT set-up. In this way, engaging cycles might have an effect on IT innovation that reaches further into the future than originally intended. A typical example occurs with websites, which act as foundational technologies upon which business owners start engaging cycles of a smaller magnitude at a later time, around such innovations as mobile website optimization or SEO.

Yet, not all engaging cycles result in adoption or switch, or in the stabilization of these outcomes in the long term. Some of my data indicate that business owners occasionally decide not to embark on the IT change they considered. This happens when the current IT set-up seems to be a better alternative than the ones explored. Several business owners,

for example, contemplated cloud technologies, but discarded them on cost or

functionality grounds, as in the comment below:

> *We wanted to switch from [the desktop version of an accounting package] to the online version. We have the desktop version, but we wanted the online version because sometimes I travel, but I talked to their tech support before switching and realized their online version is still in its infancy, it's not the same as the desktop version, it doesn't have the same functionality, payroll for example isn't available on the online version yet, so we decided not to do it. I'll re-evaluate in the future, but for now, the features of the online version aren't up-to-date.* (Participant 10)

Moreover, switch and adoption outcomes might not stabilize. Research on assimilation of

IT innovations has shown that the acquisition of an IT product or service does not parallel

its deployment within the adopting organization (Fichman and Kemerer 1999). Similarly,

initial impetus and engagement are not always enough for carrying larger IT changes

through. And even when such changes are brought to completion, they might be

discontinued sometime after. Such occurrences are captured by the model in the form of

tipping points going from an engaging cycle to a disengaging cycle. Tipping points and

disengaging cycles and are the last components of the IT encountering model depicted

here, and I discuss them, respectively, in the next two subsections.

6.4.3 Tipping Points

In geography, a tipping point, or threshold, is a crucial moment at which a system moves

from an old equilibrium condition to a new one. In this light, tipping points are time-

dependent phenomena which result from lasting changes to which the system must adjust

(Mayhew 2009).   Here, I retain the core idea contained in that definition, and argue that a

tipping point is a moment at which business owners move from an old way of thinking

and acting upon an issue, to a new one. More precisely, a tipping point suggests a shift

from one type of cycle to another one. In the model, tipping points are also event-

dependent phenomena triggered by changes (i.e., disambiguation of cues) that shake the grounds upon which previous responses were carried out, thereby prompting new directions in attention, interpretation and action. Two types of tipping point trajectories were identified in the data: situations where the business owners move from a shunning cycle to an engaging cycle, and situations where they move from an engaging cycle to a disengaging cycle. Both are discussed next.

From shunning to engagement

In tipping points where business owners go from a shunning cycle to an engaging cycle, interpretation of cues changes from suggesting a minor issue, or a small problem, to signaling a larger problem. This happens because the responses carried out during the shunning cycle (i.e., tinkering, stretching, making do) turn out to be insufficient to deal with the problem situation in a way that is minimally satisfactory. Importantly, the move from a shunning cycle to an engaging cycle involves not only a shift in attention, interpretation and action, but also an adjustment to the business owner's cause map. For example, a business owner who seemed to take pride in consistently rejecting consumer technology, moved from a shunning cycle of trying to fix his malfunctioning flip phone to an engaging cycle where he upgraded to a smartphone, and commented:

There's no point in being a complete Luddite. There's no advantage to that either.
(Participant 4)

Perhaps more revealing of the underlying learning process that seems to be taking place, is the transformation in the thinking of the owner of a law firm from wanting a software

application that could 'do it all'[9], to accepting a more modest solution which would not

do it all, but would go a long way towards solving the most critical information problems

facing the firm:

> At time 1: *We've had two software packages for a long time, one is for phonetic analytics in the area of intellectual property, the other one is admin software, and three years ago we started to build our own software where we want to have both things in a single software, and link it to invoicing and accounting, so that we have a single system for absolutely everything. We decided to do that because we couldn't find a software product that fully accommodates all the needs of our firm. We looked at several products, they were general for law firms, of for intellectual property firms, but they didn't cover the specific needs of our firm, because we have some particularities that most other offices don't. So we could have ended up buying a software product that was expensive, which would optimize some things but wouldn't integrate all our work.* (Participant 24)

> At time 2: *[The in-house software development] never really worked, we didn't get the applications we expected, we hired somebody extra to see if he could help to move things forward, but that didn't work either. We did make some progress, but it wasn't a definitive solution as we needed it to be. Now, we are doing what we initially didn't want to do, but the need was so great that we felt forced to do it, which is searching for off-the-shelf software that we can use right away [...]. So we decided to get this software package that is supposed to solve all these problems, which are 90 percent of our problems, and once we've solved 90 percent of our problems, we'll see how to fix the 10 percent that's left.* (Participant 24)

From engagement to disengagement

Towards the end of my discussion of engaging cycles, I noted that although these cycles

might lead to the adoption of technological change of a relatively large magnitude, such

outcome did not always stabilize. Adoption decisions can be halted before the technology

is fully acquired. Similarly, prior plans to improve, expand or simply continue using the

acquired technology can be discontinued sometime after adoption. The discovery of such

tipping points in the data is well aligned with the imagery of a 'fire department' put

forward by the Carnegie School, in that day-to-day feedback takes precedence over

previous plans as input of what actually gets done in an organization. Here, newer issues

become more salient and force the business owner to re-sort their priorities in ways that

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[9] The same quote, at time 1, is used earlier to illustrate differences across individuals regarding what constitutes a satisficing solution. Here, it is employed again to show how the thinking of the same individual changed over time.

shift their attention away from the focal IT situation, reduce their commitment towards the previously started course of action, and produce a reinterpretation of the situation which also involves an adjustment to the business owner's cause map. In the following illustration, I contrast the thinking and plans of a business owner around her website at time 1 – when the website was viewed as a priority – with her thinking and actual actions at time 2 – when the website was no longer viewed as a priority –:

> At time 1: *For a business like this one, it's better to have a website. Most of all we want to develop new businesses in the US. Last week we closed a deal with an American customer and everything was done by email [...]. So it's mostly for international markets, but also for our providers. People need references, and then we can direct them to our website, and they'll read about our experience and so forth. [...] [And now] I need to make some changes, I want to add some texts, translate them into English, and I want to change some of the graphics too, here in our services menu.* (Participant 15)

> At time 2, I asked her about the changes she was planning to do, and she told me: *To tell you the truth we haven't made any progress on that, because we have given priority to other initiatives. [...] [Making changes to the website] demands work from us, planning what to do, what content, what services and all that. And I know it's part of the company's marketing, but our service is so specialized that it is more about making appointments, more face to face than through the website. Because the web is like when you have something that's mass produced and you need loads of customers, then the web is essential. Here, I only need to outline what we do, making new businesses is a very personalized thing. [...] So, it's not like I'm killing the website or saying it's unimportant. It's just that sometimes priorities, budget priorities are somewhere else. For example, right now, [a document management project] takes priority over the web, because losing data because of staff turnover… that would mean losing some of the company's know-how. So that must take priority over the web.* (Participant 15)

Adjustments to mental schemata to align attitude and actual behaviour have been studied in psychology, as one of the mechanisms by which individuals reduce cognitive dissonance (Festinger 1957). Whether conflicting cognitions were changed to reduce dissonance vis-à-vis behaviour, or the behaviour changed in response to an earlier cognitive shift is not clear from the data. What can be argued, though, is that disengagement from IT change experienced by participants was manifested in both their cognition and their actions.

6.4.4 Disengaging Cycles

Disengaging cycles group responses whereby business owners suspend or reduce their commitment to courses of action they had started at an earlier time, aiming at introducing IT changes of a considerably larger scope (i.e., during engaging cycles). In my data, this change in responses is mostly associated with situations where the business owner feels that, despite significant efforts, the benefits to be obtained from performing change were not realized. This observation is in agreement with the core tenets and empirical tests of expectation-confirmation theory in the context of post-adoption behaviours (Bhattacherjee 2001).

More generally, as discussed earlier, disengaging responses are connected with a rearrangement of priorities in favour of issues that seem to require more attention, and against the focal technology explored and acquired during an engaging cycle. At this point, it is worth reminding the reader that issues taking priority can be related to the business, or they can be personal, as in the quote below, where several business activities and their accompanying technologies were suspended due to illness:

> *We have our tourism activities on a Facebook page. It hasn't been updated in a while, because people here … they're not as familiar with our tourism activities as I am, because I've had the experience. And as I was telling you, I was fighting against cancer, so a lot of our work went down. And I haven't had anybody who can take over, so all the tourism side of our activities has been kind of quiet.* (Participant 23)

As a result, disengaging cycles lead to technologies that are halted, scaled down or abandoned. The two responses grouped within disengaging cycles are halting, and downscaling / abandonment. They are presented below.

Halting

Halting responses are those where the expected trajectory of deeper engagement with an

acquired technology is interrupted. Ostensibly, the technology is not downscaled or

abandoned, but in reality the actual commitment to it is severely curtailed. Empirical

instances of halting are reminiscent of the usage of the term 'hiatus' among music bands.

When members of a music band take a break, not being sure whether they will resume

activities as a band at a later time or not, they prefer to inform the public they go on

hiatus. The term is used to mean a number of things: the band has not officially

disbanded, the current state is vague enough not to guarantee or prevent a later reunion,

and it gives individual band members a platform of freedom upon which they can embark

on alternate projects. Similarly, during halting responses business owners leave their

options open: they take a break from the course of action which led them towards a

certain technology, they award themselves the space to re-engage with that technology in

the future, and they take care of other issues which seem more attractive or important at

the moment. Technologies which can typically lead to halting responses are those where

the cost of keeping a minimum level of commitment is not seen as excessive. Websites,

and free software subscriptions, for example can be retained at virtually zero cost.

Therefore, these technologies are not abandoned, but commitment to them is suspended,

temporarily or indefinitely. The owner of a construction business described his

intermittent commitment to the implementation of a free CRM package in these terms:

> *I hired two co-op students for the summertime, and I had one of them looking at different CRMs, [we looked at] a couple of CRMs and I set both of them up [on the server] for [the student] and said, you know, play with them, add people. And I haven't done anything with it since he left unfortunately. [...] I'm thinking about having a co-op student to work on [the website] in the summer, during non-installation times. I would likely have [the student] dedicated to the website and then also the CRM if I don't have it set up by then.* (Participant 1)

Downscaling and abandonment

Downscaling and abandonment responses entail an even stronger departure from the

normative assumption of continuance, since business owners do in fact reduce their

observable engagement with the technology adopted during the engaging cycle, and they

do not appear to be willing to go back to it. In downscaling responses, business owners

retain a limited portion of the technology (e.g., they keep a single license or engage in

minimal use of the technology). In abandonment responses, business owners fully end

their commitment with the technology.

When a technology gets downscaled or abandoned because expectations are not met, the

business owner needs to find a way to do without it. Following disenchantment, the

business owner might be unwilling to try out innovative courses of action once again, and

may go back to the technological set-up they had prior to the engaging cycle – or a very

similar one –, construing it as a more effective alternative than the more 'modern'

technological change they attempted without success. Empirical instances include such

moves as cancelling online payment services to go back to non-automated offline money

transfers, or focusing on naturally occurring word-of-mouth while dumping website-

based marketing efforts. In that way, my data suggest that downscaling and abandoning

can be associated with technological regression. To the extent that responses and cause

maps co-evolve, these regressive responses appear to go together with a refinement of the

relevant cause map in which cause and effect relationships are underspecified (cf., Levitt

and March's 1988 discussion about superstitious learning). A potential downside of such

a process is that the resulting cause map would be less helpful if the business owner were

to start a new engaging cycle. To elaborate on this idea, I will illustrate with a quote first, and discuss right after:

> *We are now giving the data to our customers in a different way, we are no longer using the software and it's not in our plans to rebuild it. The problem was that the software was very slow, service was low, and our customers have no patience, so we had to look for more traditional methods which would allow our customers to do their queries [...]. So right now what we're doing is that they submit their requests [for queries] to us, and we work on them on spreadsheets, and we deliver them that way. The biggest limitation is that we would need to have somebody within the company to oversee the development of the new software, so that's not easy, and the cost of getting a software as complex as we envision it, we can't really afford it right now.* (Participant 15)

The problem lying beneath this seemingly sound appreciation of the situation, is that the business owner underspecifies the reasons for the failure: the software as a whole was a failure, hence the software as a whole is a solution path which will be discarded in the future. There are indications in the data suggesting that certain aspects of the software experience could be pinpointed more specifically as related with the failure (e.g., slow performance is one that stands out in the quote above). Such finer-grained analysis would have resulted in a richer cause map, which could in the future help inform more accurately other IT encounters. For example, it could help focus the attention on issues pertaining to software performance (e.g., are the files being downloaded too big, are there time peaks? or is the problem more complex than that?) In the absence of this finer-grained analysis, the lesson learned is too broad to be helpful.

Further, in this and other cases, the potential downsides of returning to the old technological set-up seem to pass unexamined. For example, the owner cited above was concerned about high costs of a software replacement, but apparently failed to recognize that the spreadsheet-intensive mode of operation increased demands for analyst time, making this a costly solution in that its scalability is tied to the hiring of new analysts. In

fact, in the time elapsed between the two interviews the business grew from 4 to 9 staff members, and the owner explained that the biggest driver of this growth was the need for new analysts who could serve the customers information requests, new analysts who would spend most of their time "*on pivot tables and on SPSS*".

6.5 Archetypal Wisdoms

Up to this point, I have proceeded additively. That is, I have striven to describe all the many moving parts involved in my process conceptualization of IT encountering, without really trying to distill clusters within it. For example, I have discussed various manifestations of resource constraints and several kinds of response cycles, but I have not attempted to establish, within the confines of the data, which particular resource constraints seem more strongly connected with certain kinds of response cycles. The main reason why I have not done so is that my cross-case examination of the data[10] suggests that such clusters are fragile. At any time, they can be overridden by new ecological change, leading to emergent behaviours not fitting into the pattern.

However, considering that these clusters, as a softer form of ideal types, can act as "models that assist in thinking about social phenomena" (Barley 1996 p. 407), I will present four of them. I label these clusters archetypal wisdoms to stress two aspects about them. First, these clusters are archetypal because they are grounded in typical instances present in the data, yet they condense and simplify those instances to convey a neater

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[10] For conducting cross-case analyses, I followed a case-oriented strategy (Miles and Huberman 1994), and looked at whether certain themes found about attention and interpretation (e.g., time constraints) would correspond closely with specific responses (e.g., boundary spanning) across several sequences of events, based on emergent theorizing. Cross-case analyses were supplementary, not part of the main analytical strategy. This is why they were not mentioned in Chapter Five.

picture. Second, they are called wisdoms to highlight that cause maps take centre stage in them, these wisdoms are little capsules of causal, 'if-then', knowledge acquired on the basis of experience, which are retained and exploited as needed, whose use appears sensible to the individual, and which can be self-reinforcing (Weick, 1979). These four archetypal wisdoms are to the IT encountering model what leitmotifs are to a musical composition: They are small, yet salient and recurrent patterns (of attention-interpretation-responses) which have their own identity and are located within a broader structure.

To denote the everyday nature of these wisdoms, I will present them in form of well-known proverbs or idiomatic expressions taken from the English language. Readers will recognize these sayings, will likely be able to take themselves back to situations of any sort where the saying echoes, at least to some extent, their own interpretation and responses to the situation, and will perhaps appreciate what participants are trying to do when their thinking and action follows the logic of any of these archetypal wisdoms.

Use it up, wear it out, make it do: Minimizing expenses

This wisdom uses thriftiness as the guiding principle for action. The if-then clause at play is straightforward, and it is actually contained in common definitions of this proverb: If a person does not have a lot of money, then they should try to extend the useful life of what they have. This archetypal wisdom connects several aspects of the model. As cues are interpreted, the situation is defined as a small problem, one which can be fixed with available means. The key constraint is money, and this is why frugality becomes the key parameter to define the suitability of a course of action. Interpretations of this kind go

together with shunning cycles, in which business owners will attempt to tinker with their technologies, stretch or make do, so as to minimize expenses.

I did not identify any typical outcomes resulting from the application of this wisdom. Sometimes mending efforts work and stabilize, sometimes they do not. Further research could try to distinguish characteristics that distinguish successful from unsuccessful shunning responses. Yet, it is worth noting that the proverb describes an attitude towards perishable items, and in fact it is commonly thought that it originated from a World War II public campaign encouraging citizens to prolong the life of manufactured goods. Similarly, it is likely that this wisdom, as applied to the IT encountering phenomenon, carries an underlying meaning of temporality in the shunning responses undertaken.

If it ain't broke, don't fix it: Staying away from unnecessary changes

This wisdom involves exerting discerning capacity to distinguish between changes that must be carried out and changes that do not. The former are needed because the current set-up is insufficient and fails to meet expectations, the latter are not needed for the opposite reason. Implicit in this assessment is the intuition that all changes entail risks, hence unnecessary changes trigger unnecessary risks. The if-then clause is slightly more complex, as it involves two 'ifs' and one 'then' premises: if the business owner is being prompted to change their IT set-up and if they are also convinced that their current set-up still works sufficiently well, then they should eschew prompts and keep what they have unchanged. This wisdom connects various components of the model as follows: cues suggesting change 'for its own sake' conflict with indications that things are going well. Business owners disambiguate messages by assessing the advantages and disadvantages

of both inaction and change, they conclude that benefits pale in comparison to risks. Benefits can only be marginal, because the core of their current choice still works. The largest risk is not being able to put back together a working environment as reliable as the one they have now. Business owners need to enter an engaging cycle in order to reach that assessment. Even if before they enter this cycle they already know that what they have 'ain't broke', it is through the knowledge acquired during the engaging cycle that they learn about the risks involved in change, and that knowledge is what ultimately drives their decision not to fix what does not need fixing. Therefore, the typical outcome is non-adoption or non-switch.

A reminder about my conceptualization of information technology is important at this point. Earlier, I noted that IT products and services are multidimensional, in that most of them encompass at least two, if no more, of these elements: a manufacturer, a direct provider or reseller, a delivery mode, a licensing type, a version, an operating system or a computing platform. This multidimensionality affects the encoding of failure and success. At any time, some dimensions might be working and some others might be failing. Therefore, this archetypal wisdom is often used selectively upon the dimensions which are not failing, with the intention of retaining them and changing the other dimensions. For example, if the software brand works but not the version because of its age, participants will keep the brand and upgrade the version, or if the web developer works but not the website, they will keep the person and ask for changes to the website. This observation is introduced to qualify my previous argument suggesting that the typical outcome of this wisdom is non-adoption or non-switch. In these cases, the typical outcome is likely to be a partial switch.

*Once bitten, twice shy***: Evading failure by preventing exposure to change**

This wisdom relies heavily on prior bad experiences, and discourages business owners from entertaining the thought of change, let alone trying change. The if-then clause can be formulated in these terms: If a person has had a bad experience (with a technology), then they should be careful to avoid similar courses of action in the future. This archetypal wisdom brings together engaging cycles, tipping points, money and time constraints, and disengaging cycles. Initially, the business owner embraces change, enters an engaging cycle, explores their options and adopts or switches a technology. Then, cues start to emerge indicating that the change has not been successful. This interpretation of experience leads to a tipping point whereby the individual shifts from engagement to disengagement. Further, they are disheartened by the results, and they are unwilling to enter a new engaging cycle to try to get a better result a second time around, because they are fearful that money or time invested on finding and acquiring a new technology will be wasted again.

The typical process outcome is a severely scaled down or abandoned technology. The learning outcome is all the more discouraging, and is crisply summarized by a business owner who openly admits she has been bitten:

> *It is very hard when you're trying to use the technology out there and it just keeps backfiring, you get very frustrated and so much for technology, I'll go the old fashion way!* (Participant 6)

*Doing what it takes***: Overcoming obstacles and facing change**

In essence, this wisdom is a self-directed and rather desperate call to arms to stop the operational pain produced by the use of a malfunctioning or inappropriate technology.

The if-then clause is again straightforward: If a person has a burning problem, then they should do whatever is necessary and do not stop until they solve the problem, no matter which obstacles they might need to face. The model components more clearly clustered within this archetypal wisdom are disambiguation of cues, definition of big problems, limited knowledge and engaging cycles. Here is how they interconnect: cues might initially suggest a potential problem or a small problem, but they accumulate or aggravate so as to suggest a much worse issue. The problem gets so big that inaction, or little tinkering efforts, are not an option, there is simply too much at stake. A solution is desperately needed for the business to continue or resume normal operations, the sooner the better. To be sure, money and time are an issue but one that can be sorted out. Knowledge, or rather lack thereof, is a much more critical constraint, inasmuch as business owners know the problem, but not necessarily the solution to it. Therefore, they must embark on an engaging cycle as a means to acquire that knowledge, and then develop and follow an appropriate course of action. During the engaging cycle, doing what it takes means combining as many responses (i.e., search, experimentation, boundary spanning, screening and DIY) as necessary, until an appropriate course of action is identified. Typical outcomes are adoption and switching.

Chapter 7   Discussion

The central motivation informing this dissertation has been to help advance alternative ways to think about and study what happens before a certain piece of information technology arrives at an organization. The context of study has been small business organizations. The need of an alternative perspective is justified in light of two observations. The first observation concerns structural trends in the IT marketplace: over the last three decades this market has evolved into an extremely intricate space, where an ever-growing number of dimensions affect the range of product offering, product categories abound, and a multitude of new alternatives continuously rise up, just as many others fall down. The second observation pertains to the impact of resource constraints on IT choice processes: organizations, small businesses in particular, are faced with resource limitations which affect their understanding and ability to cope with complex environments.

As IS researchers, we are well aware of, and familiar with, the complexity and dynamism of the IT marketplace. Yet, my review of the literature indicates that research efforts concerned with the early moments of IT innovation have failed to factor in some of the implications of such market complexity and dynamism into their theorizing and empirical designs. More precisely, research studies have largely proceeded as if the IT of interest to the researcher was already perceived as a distinct, relevant and noteworthy entity by the organizational decision maker, or have presupposed that a clear set of IT alternatives to choose from is already known to this decision maker.

The recurrent reliance on these assumptions has had the unexpected consequence of leaving unattended important aspects of the situation facing organizations in their early dealings with IT innovations. Notably, we know very little about how or why decision makers get to notice (or miss) situations suggestive of IT action, or about how they develop suitable courses of action to address these situations. Those gaps suggest a state of knowledge that is less comprehensive than it should strive to be. Further, and perhaps more subtly, these assumptions conform to a normative ideal of IT as the 'right' course of action for organizations which is in itself worthy of scientific interrogation, and has sparked my intellectual interest.

Against this backdrop, the research reported in this document has sought to describe and explain the process whereby individual decision makers operating in an organizational context encounter IT. IT encounters are defined as situations in which individuals pay attention, interpret and respond to cues suggesting changes to IT, in ways that appear sensible in their eyes. IT encountering is conceived from a process perspective (i.e., taking time into consideration). Several theoretical streams inform this research. Notably, the behavioural decision making, sensemaking, and mindfulness research traditions provide the main conceptual foundations used to understand the IT encountering process.

7.1 Contribution

This research contributes to academic knowledge in two distinct ways. First and foremost, it introduces the concept of IT encountering as a relevant theoretical approach to study what happens before IT enters an organization. This approach is largely missing from our literature, and its absence has hindered our comprehension of both the early moments of IT innovation and the subsequent unfolding of innovation in distinct ways: It

has prevented us from noticing and theorizing about search and other exploration behaviours which organizations often need to engage in prior to adopting or rejecting IT, it has let us ignore smaller courses of action whose scale do not qualify them as "IT adoption", and it has kept our research interests away from the dynamic aspects of organizational engagement with IT innovations. While most prior research has subscribed to a binary and rather static view of behaviours as entailing 'adoption' or 'non-adoption', the IT encountering model introduced here departs significantly from this earlier treatment and puts forward a much wider range of behaviours carried out by individuals when faced with IT stimuli (e.g., tinkering, experimentation, search, DIY, to name some), and it registers changes in these behaviours over time.

Also importantly, the IT encountering approach equips researchers in the field with theoretical tools with which to hold a more neutral stance towards the appropriateness of IT innovation. The pro-innovation bias prevalent in IS research, acknowledged at times but seldom addressed, is a problem because it embeds an acontextual belief in the undisputable goodness and desirability of IT innovation, which neither serves scientific enquiry, nor survives empirically scrutiny. My findings suggest that small business owners do not share the scholarly tradition of viewing positive and early IT innovations as inherently desirable (Rogers 2003, Fichman, 2004). More generally, the IT encountering model considers that resource constraints can constitute reasonable counter-arguments to IT innovation, rather than unwanted roadblocks that must necessarily be surmounted.

Second, this research has advanced a theoretically plausible and empirically grounded understanding of how IT encountering occurs in the specific context of small businesses.

The findings of the empirical study converge and depart from prior research on the topic in important ways. A recurring observation in IT adoption studies is that organizations with larger amounts of the "right stuff" (resources and abilities) take up innovations at a greater rate and faster pace than organizations not so favourably endowed (Fichman 2004). My findings are consistent with this observation in that they point to knowledge as a crucial pre-requisite for IT innovation, and notice there can be a considerable time lag between awareness and adoption of an innovation (Rogers 2003) among resource-constrained small businesses. But there are also important points of divergence between my findings and prior research about IT innovation in small businesses. Importantly, the findings point at the process dialectics involved in IT innovation among resource-constrained small businesses, a facet of the phenomenon which has not been explicitly incorporated in the majority of prior work in this area, and yet it greatly enhances our understanding of responses to IT innovation among this group.

In the remainder of this section I will elaborate on key areas of convergence and divergence between this study and previous literature which have implications for research, first pertaining to the topic of study and then to the population of interest. Next, I will discuss limitations of this work and present opportunities for further research. I will end with some thoughts about the contributions to the realm of practice that this dissertation has sought to make.

7.2 The Topic of Study: Mapping Convergence and Divergence

This research explores a number of areas lying in between the black and white certainties of adopting or rejecting IT, early and late adoption, or IT stability and change. These grey

areas concern ambiguous, conflicting or shifting interpretations made, intermediate or remedial actions carried out, and modest outcomes attained by small business owners in their encounters with information technology. They convey the image of an organizational reality which might very well transcend the terms upon which research on IT choice has regularly been conducted. As my discussion will show, these are not uncharted territories in any absolute sense, but they constitute less familiar grounds to the literatures on IT choice, including but not limited to those specializing on small businesses. To a large extent, the value of the research presented in this dissertation resides in putting together these areas into a single theoretical model, and in presenting them to the scholarly community as relatively less explored areas worthy of situated research attention.

Below, I will discuss four such areas. They relate to the magnitude of IT change, the dialectics of change in IT encountering, the constructed paths towards change, and the temporal limits of effected change. They are all intimately related to one another. A graphical summary of these areas is rendered in Figure 10.
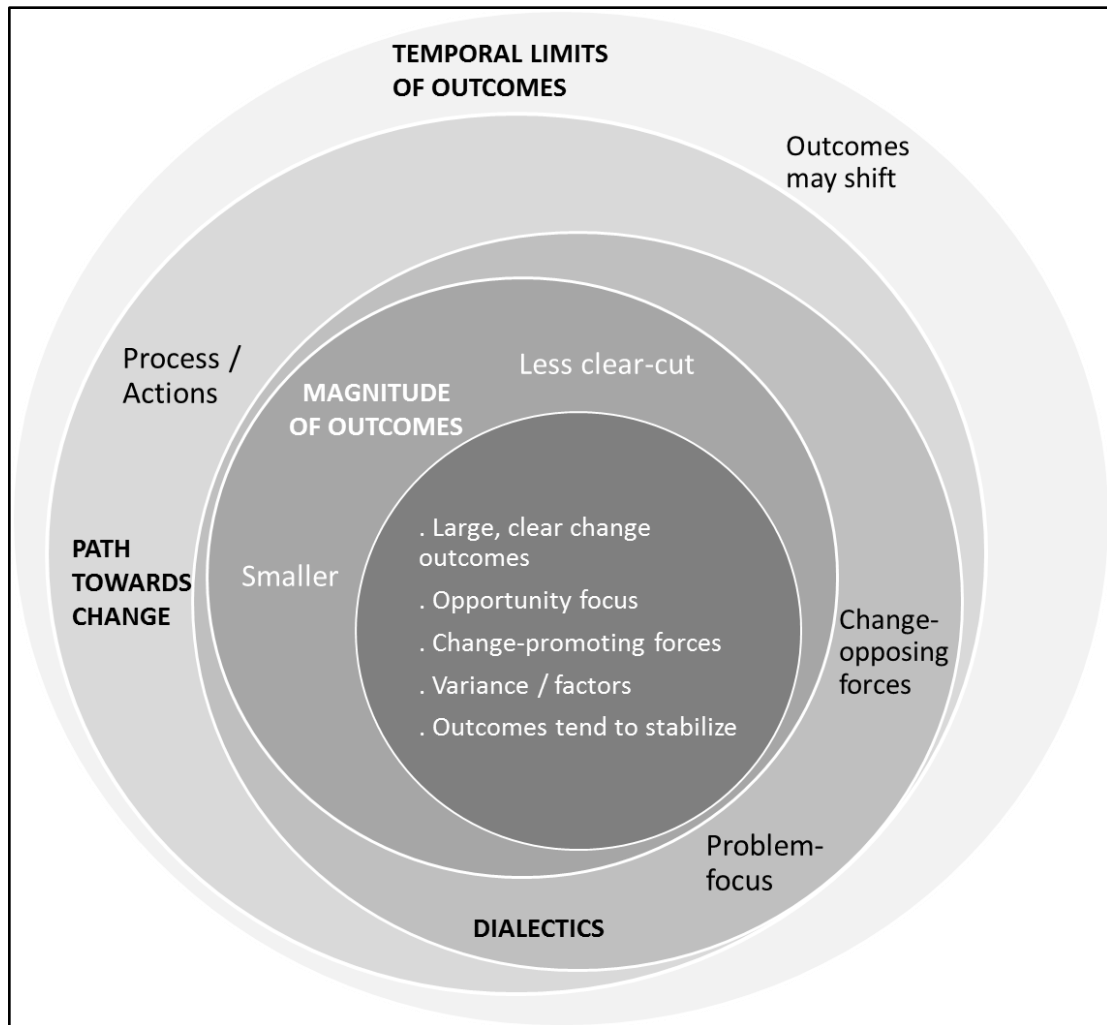
Figure 10: Areas explored by IT encountering

In the figure, the circle at the core represents the areas regularly covered by research on

IT choice. Such research conventionally focuses on large and clear change outcomes

(e.g., the selection or the adoption of a new technology), concentrates on opportunities to

introduce an IT innovation, devotes considerable attention to forces promoting change,

tracks causal factors, and implicitly assumes that change outcomes stabilize. Each of the

peripheral circles represents one of the four areas reached by IT encountering (i.e.,

magnitude of change, dialectics, paths toward change and temporal limits of outcomes).

Sizes and shades in the figure do not intend to carry any other meaning than a sense of

expansion from the core towards the periphery. A more detailed discussion of these four areas follows. My exposition is informed by the findings but is also aided by an array of academic sources which support these findings, and it seeks to show how each of these areas add to conventional foci, thereby enriching our understanding of the phenomenon of interest.

7.2.1 The Magnitude of IT Change in IT Encountering

Many IT encounters are stories of small, gradual and ongoing technological adaptation. Broadly understood, such kind of adaptation is not a new theme in IS research. In fact, it constitutes the core of generally accepted structurational perspectives within studies of technology-related organizational change (e.g., Barley 1986; DeSanctis and Poole 1994; Orlikowski 1996). Yet, those views concern changes taking place after a focal technology has been selected and adopted, and they relate to intended and unintended variation leading to mutations in patterns of use.

Conversely, the IT encountering model views change as the result of interconnected, deliberate attempts to add, replace, remove or otherwise adjust pieces of a given technological set-up with the purpose of making it more responsive to emergent situations. In general, the literature addressing this kind of changes has focused on relatively large, conspicuous changes: prominently, the adoption or selection of new technologies. My findings indicate, however, that many effected changes are not as large or clear-cut as to deserve such distinctive labels. These changes are more modest in scope and intent, hence they have slipped below the radar of most research efforts, and some of them seem to lack precise definitions in most prior research. In the model, these changes are not captured directly, but as the outcomes of responses such as tinkering, stretching

and making do. We may call them 'non-adoption' outcomes if that is the only language we have, but the path leading to them differs so greatly from inertia, that the 'non-adoption' label distorts their action-based essence.

With respect to the magnitude of IT change, my research echoes Ciborra's (1992) treatment of bricolage as a mundane and highly situated practice, performed with resources available at hand, and conducted on a regular basis (by IT specialists in his study settings) to keep IT systems functioning in the face of breakdowns and other events which downgrade their performance. Ciborra notices that bricolage activities tend to transgress formal method and are thus awarded a negative status in many cultures. He further adds that these activities "tend to be invisible both because they are marginalized and because they unfold in a way that is small in scope" (p. 305). Similarly, one might speculate that the small changes I identify in the data have passed unnoticed not only because of their size, but also because they transgress the normative expectation of larger innovation as an appropriate response.

On the whole, this view of IT change opens up space for studying changes of different magnitudes and their reciprocal connections in contexts other than IT use.

7.2.2 The Dialectics of IT Encountering

The IT encountering model developed in this research combines central features of evolutionary and dialectic ideal types of change (Van de Ven and Poole 1995). The dialectic component is manifested in the tension that results from constructing interpretations which both promote and oppose change. During IT encounters, small business owners are simultaneously pulled in two opposing directions: confronting

emergent opportunities and problems by embracing change, and preserving scarce resources by eschewing change. The literature on IT choice, and more specifically the IT adoption literature, has heavily tilted towards forces that promote change at the expense of those that oppose it (Cenfetelli 2004; Jeyaraj and Sabherwal 2008). Within promoting forces, factors related to handling problems with pre-existent technologies have been granted considerably less attention than factors related to the take-up of opportunities, a misbalance which carries the latent risk of confounding discontinuance factors with adoption factors (Furneaux and Wade 2011).

Yet, these two ideas – i.e., the idea that problems with current technologies can be a vital force in support of IT change, and the idea that IT changes are affected by colliding forces promoting and opposing it, – are distinguishable characteristics of the model, and they are not foreign to scholarship inside and outside our field. The first idea is explored by studies looking at the impact of performance gaps on IT adoption (Rai and Patnayakuni 1996), and empirically supported by studies in the areas of software maintenance and system discontinuance, which have found that organizations will purposefully embrace IT change when they identify capability shortcomings in their systems, or when demands for system maintenance increase beyond an acceptable threshold (Furneaux and Wade 2011; Swanson and Dans 2000).

The second idea is supported by studies about enablers and inhibitors of IT usage (Cenfetelli 2004; Cenfetelli and Schwarz 2011). This research posits that inhibiting factors are distinct constructs, and not simply the negative reflection of enabling factors, which have unique effects on usage intentions in that their presence clearly contributes to rejection, and may bias perceptions against technology to a level enough to cancel

enablers out, but their absence does not necessarily increase usage intentions. Further, these works draw a crucial theoretical connection with research in psychology showing that, generally, negative stimuli have a greater impact on behaviour than positive stimuli. The arguments for this are that responding to negative stimuli is crucial to survival, the negative is more memorable, triggers much more attention than the positive, and instigates greater amounts of information processing. In the IT encountering model, time, money and knowledge are treated as resource constraints which hinder change, both in isolation and distinctly through their interaction. Moreover, my evidence suggests that what promotes change is the definition of an issue to act upon, and not the recognition of having time, money or knowledge in one's hands. Therefore, the treatment of these resources in the model is closer to the notion of inhibitors. By contrast, as discussed in Chapter Two, these factors are largely treated as enablers in the literature on IT adoption by small businesses (see Cragg and King 1993 for an exception). In light of these conflicting treatments and my evidence, it is worth pausing and reflecting on which theoretical treatment will suit these resources best in future research.

More distinctively, the idea of forces in conflict, promoting and opposing a desired state of affairs, is fundamental to classic works in the Marxist and Lewinian traditions of the social sciences, and has also been used in IS studies, for example, to describe the tensions between knowledge to be learned and unlearned during ERP implementations (Robey et al. 2002). Lewin's conceptualization of inner systems of tension, which confront individual's level of aspirations (i.e., goals) with barriers against their attainment (Lewin 1948), captures very well the essence of the tension experienced by small business owners during IT encounters. In the IT encountering model, resource constraints act as

barriers which hinder action directed to address the issue that is being identified as worthy of attention. The resulting conflict "set(s) the stage for producing a synthesis" (Van de Ven and Poole 1995 p. 517), that is, a novel construction that resolves, at least temporarily, the conflict. In IT encountering, engaging, shunning and disengaging responses represent three different types of syntheses. Engaging responses resolve the tension in favour of change, while inevitably keeping resource constraints in the background of action. Shunning responses resolve the tension in favour of preserving limited resources, by minimizing the scope of change, rather than discarding it. Disengaging responses also resolve the tension in favour of preserving limited resources, by reducing commitment to a previously started course of action which was conducive to change.

To sum up, the IT encountering perspective developed in this dissertation moves the discussion of IT choices made by small businesses from the change-enabling and opportunity-centric theoretical space this discussion has conventionally inhabited, to a broader space that considers forces promoting and opposing change, and includes problems as well as opportunities as sources of change.

7.2.3 The Constructed Paths towards Change

Accepting change as a desirable goal is different from making change happen. The IT encountering perspective understands IT change as an outcome resulting from a self-constructed action path. By no means is this path straightforward or carefully planned in advance. Yet, it is a path because it starts somewhere and leads somewhere else; ideally, it goes from an undesirable to a desirable state. Typically, the path starts even before such undesirable state has been construed as such. That is why the model contains a sub-

process called disambiguation of cues, whereby cues build up to become deserving of attention, conflicting messages being read from different cues get resolved, or business owners acquire knowledge that improves their diagnostic capabilities. There is enough support in prior literature for this sub-process, in the sense that decision makers confronted with ambiguous cues are less likely to recognize an issue and act upon it (Keil et al. 2007; Weick 1995). Research on organizational attention and mindfulness suggests that cognitive and structural efforts of a singular kind may be needed for weak or ambiguous cues to be granted attention (Rerup 2009; Weick and Sutcliffe 2006). In my resource-constrained research setting, however, weak and ambiguous cues either 'disambiguate themselves' as they stubbornly accumulate to become strong and clear, or get disambiguated by a combination of mindful pragmatism and good timing.

The path to change might then continue with either a shunning cycle or an engaging cycle, depending on how the dialectic tensions mentioned earlier are resolved. Responses in shunning cycles use readily available resources. Therefore, these cycles render their minimalistic change outcome in a relatively unproblematic fashion and a short time span. Conversely, engaging cycles involve a longer and more elaborate path, often subsuming a knowledge building quest: how can change be brought about? Engaging responses are carried out to develop the answer: by searching suitable alternatives, experimenting with them, reaching out to people outside the business for advice, screening unsolicited IT offers or DIY, the studied small business owners find ways to effect change.

Because most prior literature on IT adoption has followed a variance approach, the processual aspects of adoption behaviours have been largely left out (Fichman 2004; Lucas et al. 2007). My findings coincide with the fewer studies that follow a process

approach or incorporate processual elements into their understanding of how IT innovations get to be adopted. In particular, Swanson and Ramiller (2004) discuss experimentation as an activity used carefully and selectively by mindful organizations to expand early comprehension of IT innovations, and boundary spanning as the act of exploiting "community ties in an effort to gather available information and diverse interpretations" (p. 561). Similarly, Jeyaray and Sabherwal (2008) find evidence about several actions, such as seeking assistance, inquiry and experimenting, which are carried out by individual potential adopters prior to taking up a technology. In the management literature, Fiol and O'Connor's (2003) depiction of experimentation is even closer to the findings of this study. They describe experimentation as a "variance seeking" activity that expands the range of attention and possible action, happens "on the fringes of current operations", and uses "small, fast and cheap probes to gain insight into the future, without losing flexibility to react to the future" (p. 63).

The IT encountering model complements these works in three ways. First, through the disambiguation of cues sub-process, the model teases apart more neatly the cognitive counterpart of actions in the path. Second, it adds problemistic search, screening and DIY as other actions carried out by decision makers in their path towards adopting a technology. Third, it acknowledges shunning responses as shortcuts leading to alternate, smaller outcomes.

Generally, the IT encountering perspective helps fuel the reasoning that challenges the 'early is better' assumption (Swanson and Ramiller 2004), by offering evidence that there actually is a path, a chain of events that need to happen before a small business adopts a

technology, and that walking down that path helps the business owner construct the knowledge necessary to make sensible choices towards adoption.

7.2.4 The Temporal Limits of Effected Change

Tipping points are a key landmark of IT encountering. They separate periods where different types of cycles take place. The occurrence of a tipping point sets the temporal limit of the change outcome obtained during the cycle preceding the tipping point. Thus, when a tipping point marks the shift from a shunning cycle to an engaging cycle, it also indicates that the modest change (i.e., the tinkered IT) is no longer viable and a larger change will be sought. Likewise, when a tipping point marks the shift from an engaging cycle to a disengaging cycle, it also indicates that the larger change (i.e., the adopted IT) can no longer be kept up at the same level, and a downscaled change outcome will follow.

A simple observation that follows is that the amount of adopted (i.e., acquired) technology can vary over time, upwards or downwards. Yet, in post-adoption IS research the amount of acquired technology has usually been held constant, while the variation of other variables of interest is studied. For instance, prior research has examined the extent to which the acquired technology is actually assimilated (Fichman and Kemerer 1999), the ways in which it is employed by users (Jasperson et al. 2005; Orlikowski 1996), or the intentions to continue using it (Bhattacherjee 2001). With the exception of the scant literature on systems discontinuance (Furneaux and Wade 2011; Swanson and Dans 2000), changes in the amount of acquired technology have been largely overlooked. This state of affairs can simply be a reflection of the delivery and pricing models available from the IT marketplace at the time where that research was conducted. Back then,

organizations would make a one-time payment for a number of licenses which would never expire, hence 'downscaling' as applied to the amount of technology acquired was simply out of the question[11].

With the growing popularity of cloud delivery models, scaling down the amount of technology acquired is now an option, and my data indicate that some small business owners are making use of it. Consequently, understanding why and how IT adopters modify the amount of IT they acquire becomes a relevant question. For example, it would be important to know whether patterns of use or extent of assimilation feedback into decisions to adjust the amount of acquired cloud-based IT.

My findings can point at the question but further research is needed to provide robust answers. They can only suggest that there may be transitional points at which business owners allow such modifications to happen, and that such transitional points represent fundamental shifts in the way of interpreting the situation and acting upon it. In this sense, my findings are in agreement with core tenets of punctuated equilibrium models (Gersick 1988; Gersick 1991; Newman and Robey 1992), which notice the occurrence of similar transitions and theorize extensively about them. Importantly, my model echoes Gersick's (1988) arguments that these transitions emerge when the old way of doing things no longer works, they bring about structural changes in how individuals approach and behave towards situations they encounter, but there is no guarantee that the change these transitions produce will lead to progress.

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[11] In Bhattacherjee's (2001) study, the software was developed in-house, and not purchased from the market. Yet, the impossibility of scaling down the amount of acquired technology still applies.

In sum, the results of this research suggest that more attention be granted to variations in the amount of adopted (i.e., acquired) IT over time, as different from variations in the assimilation or use of these technologies, and they also indicate that tipping points can be a useful concept for guiding future efforts in this regard.

7.3 The Population: Mapping Convergence and Divergence

This research has built and employed a conceptualization of small businesses as organizations with five constitutive features: i) independent ownership, ii) owner-centralized decision making, iii) strong reliance on owner's limited resources and capabilities for operation and decision making, iv) dependence on a generally small set of human and organizational firm-level resources and capabilities, and v) the overlap between personal and business domains as a source of tension and action.

This conceptualization converges and builds on previous work by incorporating many features which have been identified in prior work as characteristic of small businesses. As discussed in more detail in Chapter Four, independent ownership, owner-centralized decision making, and resource constraints have been incorporated in most definitions and characterizations of small businesses both in the IS field and outside it. The overlap between the personal and business domains is noted less often, but it is a crucial distinction in particular areas of small business research, notably family business research.

However, the definition used in this research also diverges from prior literature in several ways, and more importantly, I argue that I have used this conceptual definition differently from the way in which many other studies have used their own conceptualizations. My

definition omits some behavioural features of small businesses identified in prior research (e.g., reactive behaviour, flexibility) to focus on resources instead, and it encompasses all small businesses and not only entrepreneurial firms (understood as those owned and run by innovative and strategically-minded individuals, as per Carland et al. 1984). Further, I have striven to thoroughly employ the definition for informing my thinking around theoretical development, research design, and research execution. That is, in a way that uses those constitutive features as a central aspect of the theorizing and data analysis processes, thereby producing findings which are specific to the nature of small businesses. For example, by retaining the tension between personal and business domains in the conceptual definition and carrying this feature through data analysis, I was able to describe with high specificity how *personal* considerations (e.g., own possession of money, illness, family demands) are of paramount importance in processes of attention, interpretation and responses related to the *business*.

Both the definition and my use of it can guide other researchers through their thinking about possible ways to study small businesses.

7.4 Future Research

For conducting this research work, I chose to follow a methodological strategy which prioritized breadth over depth. During data collection and analysis, I attempted to elicit and then refine a comprehensive set of coding categories which appeared to play an important role in the phenomenon I had sought to examine. This methodological choice has meant that a more in-depth exploration of each of the model's components is beyond the scope of this dissertation. Consequently, there are a number of issues that would deserve further development in future research. Some of these issues have been

introduced earlier in this chapter, as areas which the IT encountering model addresses, but are less well covered by prior research on IT choice. Other issues relate to specific responses, or facets of these responses, as revealed by data analysis, for which specific theoretical support seems scarce. Particularly, this is the case of DIY, screening, the arguably excessive reliance on boundary spanning I noted in some events, and the practice I labelled as search scaffolding.

I will only elaborate the case of DIY responses, which is remarkable because it was a frequent occurrence in the data, and the fit with extant theory is especially low. In the previous chapter I commented how the DIY responses I identified appear to be at odds with various pieces of knowledge one could use to explain them. First, they proceed in a way that is similar to problemistic search, but might scrap actual search altogether. Second, conventional knowledge about buy vs. make software decisions does not capture the rationale behind them. According to such knowledge, software development work that is deemed strategic should be retained in-house, and the rest should be outsourced to benefit from external expertise and cost efficiencies. Here, non-strategic development work is done in-house, under a fundamentally different view of costs and risks. Third, while other perspectives could be brought to bear to explain DIY responses, my preliminary exploration of alternative sources suggests only limited agreement between these other perspectives and my findings. For example, from the perspective of cultural studies DIY can be understood as a counter-culture. In setting up the tone of his exploration of DIY as a cultural phenomenon, McKay (1998) refers to home-made, unsophisticated, imaginative and immediate actions, and then goes on to associate them, on the one hand, with narcissism and youthful arrogance, and on the other hand, with

resistance and protest against the socio-political status quo. The powerful descriptors he uses to depict DIY actions resonate with all the empirical events I coded as DIY, but the causal linkages he establishes (to views of the self and purposeful contestation) would only speak to a couple of events. The limited fit between theory and data indicates that more research work is needed in order to obtain a better understanding of DIY responses in the context of small businesses encounters with information technology. This is important because the IT skills required for DIY are a relatively low bar, hence we can expect that a good number of small businesses owners will possess or be able to readily acquire these skills[12].

Another opportunity for further research lies in the possibility of broadening up the boundaries of the IT encountering perspective advanced in this research, to increase its pertinence for larger businesses. This dissertation has uncovered two assumptions underpinning most literature on IT choice (namely, the IT adoption literature presupposes the saliency and significance of a focal technology to a decision maker, and the literature on IT selection generally assumes that suitable IT alternatives are known to the individual making choices) and has sought to devise an alternative theoretical perspective with which to overcome some of the conceptual deficiencies resulting from the unintentional yet repeated reliance on such assumptions. Although the reliance on these assumptions is pervasively found the literature on IT choice, and not just in the subset of the literature looking at small businesses, and the theoretical foundations informing my work are also broader, my use of theory, the methods and the findings have had a deliberate focus on

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[12] For example, web content tools such as Joomla! or WordPress can be used to develop websites with almost no technical knowledge required.

small businesses. Therefore, caution would be needed for extrapolating the current IT encountering perspective to a larger business context.

The model of IT encountering that I have put forward goes three levels deep. It is my contention that the two highest levels could be extended to larger businesses relatively well, albeit with some adjustments, but the third level would need to be substantially rethought for contexts other than small businesses. To substantiate this claim, I will start by providing a very brief outline of the three levels, and will then elaborate on the rationales for and against extension at these three levels.

The highest level, rooted in Weick's evolutionary model of organizing (1979), depicts a process going from ecological change, to attention and interpretation (cognitive core), to responses (action core), and cycling back. The middle level zooms into the cognitive core and the action core. In the cognitive core, the model describes the central role played by cause maps and describes three sub-processes taking place simultaneously, namely disambiguation of cues, definition of problems and opportunities, and reckoning of levers and constraints to action. The action core comprises the three types of response cycles a decision maker might enter, which are related to their cognitive representation of the situation and entail different attitudes towards large IT change: individuals might shun relatively large IT change, engage with it or disengage from it. The model's lowest level delves into the specifics of each of the three cognitive sub-processes and the three types of response cycles forming the model's middle level. This is the level that is closest to the data, and it reveals, for example, the trade-offs involved in certain interpretations made by business owners, and the responses that go along with these trade-offs.

The first level is sufficiently generic to have applicability across a broad range of contexts, and this in fact is not an attribute of the model per se, it is only a reflection of the robustness of Weick's theoretical work (Sutcliffe et al. 2006), which underpins it. The middle level is more specific, but it is still generally applicable to organizations of any size. Importantly, the cognitive core plays out the tension between forces promoting change (i.e., problems and opportunities) and forces opposing change (e.g., resource constraints), and recognizes that cues might need to be disambiguated for action to take place. Although both themes are discussed in the model mostly at the individual level of analysis, arguably they can exist at the organizational level, and extrapolation efforts would need to consider how to scale up these sub-processes to that level. In larger organizations, this level will certainly be more complex, as there will be heterogeneous organizational members going through these sub-processes, there will be more elaborate structures for planning, decision-making, work execution and control, and issues concerning the informal organization (culture, social relationships, power and politics) will play out more vividly. All these issues are known to affect patterns of attention, interpretation and action, and they were not explicitly incorporated in the model. The action core describes how the dialectic processes at play are resolved, by means of cycles in which businesses react positively or negatively towards large IT change. Similar syntheses, and their constitutive cycles, may be taking place at larger organizations, and for the same reasons listed above, the issue of level of analysis would need careful consideration if an extension is pursued.

While careful work on those issues would be needed, the payoffs might be worth the effort. For example, by focusing on severely resource-constrained organizational units,

this research has been able to distinctively explore the multi-faceted relationship between resource limitations and IT change. Most organizations face resource constraints, albeit to varying degrees, and the IT encountering framework can provide some conceptual guidance in this regard.

The discussion at the lowest level is inexorably attached to the nature of decision making in small businesses. In particular, I identified unique constraints sitting at the intersection between limited time, limited money and limited knowledge, discussed the trade-offs small business owners make between benefits expected from IT change and experienced constraints to action, and noticed how these interpretations impinge upon responses, for example by being conducive to tinkering, intensifying the use of boundary spanning, or leading to an arguably premature halting of change efforts. At this level, the applicability of the model beyond severely resource-constrained environments will be very limited. In essence, larger organizations might have some of these limitations, but these limitations might not intersect as they do here to produce newer, more stringent constraints. Concomitantly, responses might display some resourcefulness, but it is reasonable to expect that they will be more driven by the issues faced than by constraints. All in all, future research aiming to extend the IT encountering perspective to other contexts can be valuable, but would need to carefully assess what each level of the model may and may not offer.

7.5 Limitations

The limitations of this research must also be acknowledged. First, the literature review was thorough, but not exhaustive, and my own biases might have affected the choice of journals, keywords and other related criteria I used to locate and select articles for review,

thereby influencing my characterization of the IT adoption and IT selection and evaluation literatures. Some of the articles which I included in the review were not captured by the keyword search, they were added by reviewing citations in identified articles and going backwards to those citations. While this practice increases coverage of relevant literature (Webster and Watson 2002), it can raise some issues about transparency, should anybody try to replicate the search.

Second, both the theoretical foundations and the resulting IT encountering perspective is focused mostly on individual cognition and could be enriched by complementing it or juxtaposing it with alternative approaches, more historically aware and more explicit about the influence of social structures on individual behaviour. For example, the criticism of diffusion approaches that they have focused too much on the adopter side, and not paid sufficient attention to the supply and institutional forces affecting innovation processes (Attewell 1992) can be extended to this work.

Methodologically, the sampling methods did not proceed so as to obtain a statistically representative cut of the small business population, yet the resulting sample might appear as overly spread out in terms of owners demographics, firm demographics and technologies. A reasonable concern is the extent to which one can draw robust conclusions out of data collected from this imperfectly sampled group of individuals, businesses and technologies. What must be remembered about the sampling strategy is that it aimed at diversity, where little could be known in advance about the sampled individuals, businesses and technologies. Aiming at diversity rather than representativeness is an accepted practice among qualitative researchers (Eisenhardt 1989; Miles and Huberman 1994; Strauss and Corbin 1998). In case study research,

diversity is often obtained by the use of both theoretical sampling (Strauss and Corbin 1998) and multiple cases, preferably somewhere between four and ten cases (Eisenhardt 1989). In this research, the potential dangers of sampling selectively were addressed by using a relatively large number of cases (29 business owners) (Miles and Huberman 1994) and by doing systematic comparisons across individuals, technologies and sequences of events (Miles and Huberman 1994, Strauss and Corbin 1998). Further, in keeping with the research objectives but also mindful of the characteristics of the sample, the analytical strategy and the resulting model put a stronger emphasis on unveiling the many moving parts involved in IT encountering and eliciting their plausible temporal associations, than on distinguishing causal linkages across those parts.

Also concerning methods, an additional limitation is related to the sole reliance on retrospective accounts for data collection, because of the known cognitive biases affecting retrospective recall. This topic was discussed at some length in the methods chapter, where I explained the safeguard measures I used to mitigate the risks associated with retrospective data collection, namely the use of the critical incident technique for interviewing, and the sampling of both past events and events taking place at the time of interview.

Finally, by using a methodological strategy that prioritized breadth over depth, this research might have tried to reach what it cannot grasp. Fortunately, this aspiration has been celebrated by scholars in the field who think that reaching beyond what can be grasped is "the heart and soul" of the field's future (King and Lyytinen 2004 p. 550).

7.6 Concluding Remarks

At this point, my discussion has been remarkably silent about how this research can make a contribution to practice. Yet, engaging with the world of practice is a central motivation underpinning this work, or more precisely, underpinning the research program where this work belongs, which has the ultimate goal of informing policy debates related to the adoption of IT among small businesses.

There are two specific routes through which this research can aspire to have a positive impact on practice. First, the normative ideals portraying IT innovations as appropriate and desirable undertakings are pervasive, hence they are not foreign to small businesses. Yet, in its own right, the institutional desirability of IT innovations offers very little in the way of concrete mechanisms to remove the money, time, knowledge and intersectional constraints experienced by small businesses. Needless to say, the discrepancy between what one "should have" and one "can afford" creates an unpleasant and unhelpful feeling, which I was able to grasp first hand in the interviews. This research has attempted to suspend any pre-conceived notions of what constitutes an appropriate or desirable course of action, and it has preferred to give voice to the interpretations and actions of small business owners in their everyday dealings with IT innovations. By doing that, it shows that the normative ideal promoting IT innovation does not necessarily align very well with what business owners consider appropriate action under their circumstances. Thus, the findings of this research support an alternative set of normative principles, in which the desirability of IT innovation is not considered in absolute terms, but must be weighed against, or in relation to, the demands of the personal and business context. This new and situated normative template challenges dominant, and rather acontextual, normative

ideals about IT innovation. In this way, this research could help lay the foundations for a more accepting institutional environment, where different responses to IT innovation might be seen as sensible, or might at least be given the benefit of the doubt. Such an environment would perhaps constitute a better place for small business owners to make informed decisions around information technology.

Second, the work of government agencies, trade associations and other environmental actors currently promoting IT adoption among small businesses might also benefit from an inspection of their beliefs around the inherent desirability of IT adoption across small businesses. Updating these beliefs in a way that is consistent with the results of this research, could perhaps enable these institutions to envision and implement programs which embraced and supported a wider pallet of potential forms of technological adaptation by small businesses.

There are substantive reasons why the world of practice can benefit from attaining an understanding of IT innovation among small businesses which is closer to the IT encountering perspective advanced in this research: small businesses are the majority of businesses and exist by millions in most countries, a good number of these businesses will continue to emerge as a result of socio-economic processes deeply entrenched within a post-industrial, mostly neoliberal, understanding and conduct of economic policies and business activities. In this context, small businesses are usually expected to be a key driver of socio-economic development and growth, but regrettably many of them fail to deliver on that promise. Consequently, assisting small businesses in becoming better at adapting to an environment that is more complex than themselves is definitely a worthwhile enterprise. To the extent that small businesses can be empowered in making

better choices when faced with IT stimuli, they deserve to be served in a way that is

attuned to their own needs and not to the needs of an entrepreneurial community

diffusing the latest IT innovation. With this research, I hope to contribute to a broader

discussion aiming, ultimately, to empower small business owners as assertive IT decision

makers.

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Appendices

Appendix A: Literature Review on Small Businesses IT Adoption

My review of the literature on IT adoption by small businesses sought to elicit the main assumptions upon which scholars in the IS field have studied the subject, the work templates used to conduct this research, as well as the key concepts and themes which constitute our accumulated knowledge to date. Rather than aiming for a fully comprehensive review, I opted for a selection of articles which may be generally deemed of good quality within the field, and as such likely to influence subsequent scholarly efforts.

In keeping with these objectives, my literature search focused solely on articles published in IS journals. I included the eight journals included in the Senior Scholars' Basket of Journals of the Association for Information Systems (http://aisnet.org/?SeniorScholarBasket), plus Information and Management and Information & Organization, as two additional, field-specific scholarly journals. Search focused on empirical research articles, and was based on keywords but also supplemented by reading the journals' table of contents. Keywords combined terms relating to adoption (i.e., adoption, acceptance, diffusion) (Williams et al. 2009) with terms relating to small businesses (i.e., small businesses, small companies, small firms, SMEs, small and medium enterprises); 35 articles were found in this way, 9 of which were discarded because they dealt with employee adoption after IT had entered the organization, they mentioned an adoption-related keyword but addressed broader or mostly post-adoption issues, or they followed a vendor perspective, thereby offering little insight into the adopter's situation. To this list, I added 2 more titles, which were published in the journals included in my search and were regularly cited in the articles I found, but were not located via the automated search. With this addition, I reached the number of 28 articles included in my review.

Appendix B: Literature Review on IT Selection and Evaluation

My review of the literature on IT selection and evaluation is equivalent in spirit to my IT adoption review. It sought to uncover the main assumptions and research patterns underlying this area of study, as well as the central concepts and themes constituting our accumulated knowledge. The review does not aim to be comprehensive, but to draw on a selection of articles which may be generally deemed of good quality within the field, and as such may be or might become influential.

The same ten IS journals were selected for the literature search. Search followed the same procedures, but combined terms relating to technology (i.e., technology, IT, software) with the term selection. Initially, additional terms connected with IT selection were considered, namely evaluation, procurement and choice. However, the use of these terms brought up articles that had already been identified through the keyword 'selection', it picked up many articles with no connection to the topic of investigation (i.e., about topics such as ex-post evaluation of the value of IT investments, e-procurement, or choice of IT governance structures), and it added very few new articles relevant to my research. Therefore, these keywords were dropped from the search. Despite narrowing down my search in this way, I located 85 articles, 57 of which were discarded after reading the abstract because they did not specifically address the topic of interest, but other topics such as product selection in e-commerce settings, selection of contracting mechanisms for governing buyer-seller relationships, or media choice, among others. To the revised list, I added a study which was published in one of the journals included in the search and was regularly cited in the articles I found, but was not picked up by the automated search, reaching the total number of 29 articles included in this review.

Appendix C: Empirical Treatment of Small Businesses in Prior Research

My perusal of the IS literature on small businesses suggests that most research studies employ, directly or not, operationalizations issued by governmental agencies. Generally, these operationalizations are based on one or more of three criteria: number of employees, sales and assets. The first criterion seems to be one the most commonly used (OECD 2005). Table C.1 shows the operational definitions of micro, small and medium businesses, by number of employees, in six world regions where most of the research I reviewed has been conducted.

Table C.1: Some operational definitions of small businesses around the globe

Country	Micro	Small	Medium
Australia	Up to 4	5 to 19	20 to 199
Canada	Up to 4	5 to 100	101 to 499
European Union	Up to 10	11 to 50	51 to 250
Hong Kong			Non-manufacturing: up to 50 Manufacturing: up to 100
Singapore			Up to 200
United States		Generally, up to 500; but upper bound ranges from 50 to 1,500 depending on industry	

Sources: Australian Bureau of Statistics (2001), Industry Canada (2012), European Commission (2003), Hong Kong Trade and Industry Department (2013), SPRING Singapore (2011), U.S. Small Business Administration (SBA 2014).

The lack of common ground in operationalizations of small businesses across different geographies is noteworthy, and it carries over into the studies I reviewed (listed in Tables 1 and 2). On the lower end, three Australian-based, multiple-site studies (Gengatharen and Standing 2005; Poon and Swatman 1999; Quaddus and Hofmeyer 2007) and one Spain-based, single-site case study (Molla et al. 2006) include companies with 20 employees or fewer. On the upper end, three US-based studies (Grandon and Pearson 2004; Lee and Larsen 2009; Riemenschneider et al. 2003) include companies with up to 500 employees. The last two studies report that the average business sizes in their samples were, respectively, 192 and 143 employees.

This disparity is further aggravated by the fact that efforts to distinguish among micro, small and medium-sized businesses are not carried out consistently. Some countries make the distinction, some others do not; some studies use the distinction, some others do not, and the use of this distinction does not always reveal how the businesses included in one study compare in size to the businesses included in another study. For example, one of the aforementioned Australian studies (sampling businesses with fewer than 20 employees) uses the *SME* acronym (standing for small and medium enterprises) all through the study, and one of the American studies (sampling businesses with up to 500 employees) refers solely to *small businesses* throughout.

The diversity of operationalizations and understandings of small businesses prevalent in the literature is consequential with respect to the construction of cumulative knowledge, as it indicates that our knowledge rests upon an empirical basis which is highly heterogeneous in terms of the very thing it is meant to have in common: business size.

Although very often these operationalizations have been used as is (e.g., Grandon and Pearson 2004; Kendall et al. 2001; Thong 1999; Wang and Ahmed 2009), sometimes they have been used as guidelines for researchers to develop their own sampling criteria, while staying within the boundaries of existing operationalizations. In some of these cases, especially in older studies, researchers have chosen to rise up the lower bound to 20 or more employees, so as to improve the chances of surveying companies with some level of IT involvement (e.g., Harrison et al. 1997; Raymond 1985). While sensible in the context of these studies, this practice has moved our knowledge closer to the largest businesses within the small business universe. In most countries, however, such segment is the smallest segment within the small business population. According to OECD statistics, business with 20 employees or fewer are

87.4 percent of all businesses in the U.S., and 98.3 percent in Australia, with all other OECD

countries falling somewhere in between those two figures (OECD 2010). This raises a

generalizability concern, because this knowledge has been built upon an empirical base which

departs greatly from the typical small business (Molla et al. 2006).

Additional References (not included in main list)

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Appendix D: Ethics Approval Form

Western Research

Use of Human Participants - Ethics Approval Notice

Principal Investigator: Nicole Haggerty
File Number:104439
Review Level: Delegated
Protocol Title: Information Technology Acquisition Decisions of Small Business Owners and Managers (002/11 BREB)
Department & Institution: Richard Ivey School of Business\Ivey School of Business,Western University
Sponsor:
Ethics Approval Date: October 11, 2013 **Expiry Date:** July 31, 2014

Documents Reviewed & Approved & Documents Received for Information:

Document Name	Comments	Version Date
Revised Study End Date	The study end date has been extended to July 31, 2014 to allow for continuation of the study.	

This is to notify you that The University of Western Ontario Research Ethics Board for Non-Medical Research Involving Human Subjects (NMREB) which is organized and operates according to the Tri-Council Policy Statement: Ethical Conduct of Research Involving Humans and the applicable laws and regulations of Ontario has granted approval to the above referenced revision(s) or amendment(s) on the approval date noted above.

This approval shall remain valid until the expiry date noted above assuming timely and acceptable responses to the NMREB's periodic requests for surveillance and monitoring information.

Members of the NMREB who are named as investigators in research studies, or declare a conflict of interest, do not participate in discussions related to, nor vote on, such studies when they are presented to the NMREB.

The Chair of the NMREB is Dr. Riley Hinson. The NMREB is registered with the U.S. Department of Health & Human Services under the IRB registration number IRB 00000941.

Sign

Ethics Officer to Contact for Further Information

This is an official document. Please retain the original in your files.

Appendix E: Interview Protocol

Interview questions were designed to remind the interviewer of the issues to be covered. Text in brackets refers to notes, and was not to be read aloud.

Section 1: Reviewing Decisions

Think of situations in which you have personally made the decision of acquiring (or not acquiring) information technology – IT – for business purposes. We will refer to each of these situations as an IT acquisition decision. Please focus primarily on major IT acquisition decisions, which are ones that (could have) represented substantial effort or cost, or those which (could have) carried important implications for the business.

To help you identify the kind of IT acquisition decisions we seek, think of the following possibilities:

- Software you might have bought (or thought about buying) for supporting important business functions, such as operations, marketing, customer service, finance, payroll, etc.
- IT products that are particularly relevant to your business or your industry (e.g., do you customers or providers ask you to access specific software? Does someone in your business use particular software for assisting product design, project management, or tracking customers' orders?).
- IT infrastructures or platforms that lay behind other programs you use: have you done any important purchase of hardware? Do you have all the computers networked? Do all computers and devices use the same operational systems (e.g., Windows, Linux, iOS).
- Finally, consider important services (as opposed to products) that you receive from an IT vendor on a regular or occasional basis, and that are important for the business: Do you buy any services for your website to work? Do you rent access to software? Do you pay an external firm to manage any of your business data?

Please use the former questions as suggestions, feel free to identify and discuss other major IT acquisition decisions you may have faced.

Section 2: Critical Incident Questions

Business context: I would like you to tell me what was happening at the organization at the time the decision was made, and why was an IT acquisition considered. What was the issue? What aspect(s) of the business would be affected by the technology? What was the role expected from IT? When did this happen?

Decision triggers: Imagine that you have been placed back in time into that time. Was there any particular event that really made you consider the possibility of an IT acquisition? If so, what happened? Why did it make you think of IT as a possible way to handle it?

Influential people around the decision: Who had the idea of considering IT for the issue? Did you consult any other person (friends, colleagues, business network) before making up your mind? What did they advise you to do?

Gathering alternatives: Now let us focus on what happened after you were decided to consider IT as a possibility. Did you consider several alternatives?

- [If yes] which ones and why? Did you try and get information about them? How did you do it? How similar or different were they?
- [If no] what did you do and why? The product you were considering… which one was it? Or what was it like?

Were there alternatives that you were aware of but deliberately decided not to consider? If so, which ones and why?

Selection criteria and process: Now, try to remember how the decision was made.

- [If several alternatives were considered]: Were there alternatives that you liked best? If

so, which ones and why? Were there alternatives that you did not like? If so, which ones

and why? Did you acquire an IT product? Which one? Was there any other reason why

you selected that particular one?

- [If only one was considered]: Did you acquire an IT product / service? Why or why not?

Seen in retrospective, was this an easy or a hard decision to make? Why?

IT marketplace: Different IT vendors and consultants have different strategies to approach their

potential customers and sell their products and services. Techniques include free trials, demos,

providing references of previous customers, and many others.

- In your case, were there any particular actions or behaviours on the part of the IT

  provider that you would like to talk about? Do you think your decision was somewhat

  affected by such behaviours? Why or why not?

- Did you know or had you heard about the IT provider before? Please explain.

The exchange conditions: Academic researchers have limited knowledge of the specific

commercial terms on which IT products and services are offered to small businesses. Could you

please tell me some of the specific terms under which you got the IT we have been talking about:

- What was/is the price? Was it a lump sum, a monthly fee, or how does / did it work? Do

  you own IT, do you rent it, is it a service fee, or does it work differently? How so?

- What do you get in exchange? (Remind them of service aspects such as customer support,

  warranties, training, etc.). Of those things you get, which ones do you think are more

  important for your business? Why?

Section 3: General Questions

Decision maker views about IT: For your personal life, what do you think about IT? Are there

products you particularly like or dislike? Why? Are there IT trends you particularly like or

dislike? (By trends help them think of what IT is today: pervasive Internet connection, mobility, virtual environments, interactive videogames, etc.).

Let us think of IT in the context of this or other businesses you have participated in. How would you rate the importance of IT for doing business? Please explain.

Decision maker views as an IT user: How often do you use IT, either for personal or business reasons? Please explain. For how long have you used IT? Are there any particular products you deliberately use / not use? Why?

Decision maker's previous experiences with IT acquisition: Have you made other similarly important IT decisions in the past? About how many? Please, briefly describe the situation. In retrospective, what did you learn or conclude from those experiences?

Curriculum Vitae

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