Business Process Affordances

by

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“I can no other answer make but thanks, and thanks; and ever thanks”

(Shakespeare, Twelfth Night, Act III, Scene 3)

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for his unconditional love and
always being there for me ...

and

to my daughter, Katherine Rozycki,
to be inspired and encouraged to reach for her dreams,
no matter how far they may seem.
Abstract

Business process designers are increasingly being challenged to develop processes that are not only useful in achieving business objectives but are also accepted by process participants and followed in the work place. Empirical evidence suggests that process bypassing is a common phenomenon in organisations. The continued mismatch between process design theory and practice gives support to the contention that the area is not well understood and demands further research.

This thesis reports on a hermeneutical phenomenological investigation which explored the life experiences of business process participants to understand what is important for them during process enactment. The insights gained during this research offer significant contributions to the Business Process Management and Information Systems disciplines.

The main recommendation of the study is to design business processes by relying on Activity Theory which considers a number of sociocultural elements of the business process environment and the Theory of Affordances which looks at enabling conditions of the environment where human actions take place. Such an approach can lead to a more satisfying design, bringing us closer to the creation of processes that are a better fit between the systems, processes and their users.

The research develops a theoretical Affordance/Activity Framework illustrating an intricate net of relationships between the process subject, design, and enactment. It also provides practitioners’ heuristics for designing processes that facilitate the emergence of process affordances. This ultimately encourages participants to better perform the goal-directed actions required to produce the outcomes that more closely match the planned process objective.

The novel approach proposed by the current study incorporates psychological and social factors into the process design, which in turn can increase system adoption and decrease process bypassing, and ultimately assist in making an organisation's work more effective, efficient and capable of adapting to an ever-changing environment.
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Acronyms

AAF  Affordance/Activity Framework
ABC  Activity Based Costing
BI   Business Intelligence
BPD  Business Process Design
BPM  Business Process Management
BPR  Business Process Re-engineering
CPI  Consumer Price Index
DOL  Division of Labour
ERP  Enterprise Resource Planning
HR   Human Resources
KPI  Key Performance Indicator
IS   Information Systems
MYOB Mind Your Own Business
MRP  Material Requisition Planning
ROI  Return on Investment
SAP  System Applications Products
1 INTRODUCTION

1.1 Background to the Study

A business process is “a structured, measured set of activities designed to produce a specified output for a particular customer or market” (Davenport 1993, p. 80). Business processes often require the involvement of multiple business functions and cut across organisational divisions, to align themselves with enterprise goals rather than the objectives of a specific business unit. Process design is often addressed when new information systems are implemented. For these reasons, the quality of the Business Process Design (BPD) is considered a critical success factor in many business and information technology (IT) projects (Štemberger, Vukšić & Kovačič 2009) and Business Process Management (BPM) is widely seen as the top priority in organisations intending to survive the current competitive markets (Gartner 2005).

When people cannot follow the process or find that it hinders their work they work around it or simply disregard it. Empirical evidence suggests that such process bypassing is a common phenomenon in organisations (Outmazgin 2013). Furthermore process bypassing can lead to serious business problems through: information loss, extension of the product/service problem resolution cycle and decrease of customer satisfaction (Reidenbach, McClung & Goeke 1998); mismanagement of supply chain (Association of Modern Technologies Professionals 2015); decrease in employee retention (Lakshminarasimhan 2011); weak collaboration between process participants (Cain & Haque 2008); and ultimately negatively influence the organisation’s financial result. The continued mismatch between process design theory and practice (Bandara et al. 2007; Dobson, LeBlanc & Burgoyne 2004; Mendling, Reijers & van der Aalst 2010) gives support to the contention that the area is not well understood and demands further research.

Previous attempts at addressing the problem of process bypassing concentrated mainly on measuring conformance between the process definition (the way the process is designed) and the process that is actually carried out (enacted). This is confirmed by empirical research undertaken by Vergidis (Vergidis, Turner & Tiwari
(2008) that found the majority (84%) of respondents focus on the process inputs and the steps required to produce desired outputs. Possible bottlenecks are identified and potential process alternatives are compared while human aspects relating to people who are to perform the processes (process end-users) are ignored. While existing approaches may be useful in achieving purely business objectives, they may prove insufficient if future process participants reject them (Bandara et al. 2007).

My 15 years of professional experience in implementing information systems and redesigning business processes suggests that individuals’ needs and capabilities are frequently ignored by practitioners. By neglecting the process end-user perspective process design focuses on the views and assessments of academics, vendors, consultants, or modellers (Indulska et al. 2009). As a result processes are frequently not accepted by participants (Outmazgin 2013). The current study aims to fill the gap between process design and enactment by viewing a business process as a complex sociotechnical construct that involves human interaction and relationships within the work environment and existing social groups (Boland 1985).

People should not be seen as unaided individuals separated from a social group and from supporting artefacts, but as an integral part of the environment in which they work, an environment which assists or impairs their actions. By focusing on enabling conditions and opportunities to act within a business process, as explained by the Theory of Affordances (Gibson 1979), it is possible to elucidate the relationship between individuals’ needs and capabilities, and the structure and dynamics of the business process. A greater compatibility between the process design and its participants may meet the challenge of developing processes that are useful in achieving business objectives and accepted by participants (Bandara et al. 2007). This in turn will improve the alignment between process design theory and practice.

According to the Theory of Affordances, humans perceive the opportunities for actions afforded by the environment around them. We see an invoice not as a piece of paper of a particular size and colour but as something that communicates to the customer a request for payment so the specific sale can be finalised. If the invoice is being sent with the goods it also affords checking of the shipment. When the
information provided on such an invoice is incorrect it may trigger additional interactions in the form of phone calls or letters from the customer to solve the dispute. If the information system that generates invoices is not user friendly or frequently freezes the invoice will also generate negative emotions in the form of frustration. In the words of Gibson “affordances of the environment are (...) what it provides or furnishes, either for good or ill” (Gibson 1979, p. 127).

While action opportunities present themselves in the environment, importantly, they are dependent on an individual’s capabilities. That is, affordances are relations between the abilities of actors and features of the environment which afford behaviour (Chemero 2003). For example, a stairway can afford climbing for an adult but not for an infant. Over time, Gibson’s concept of affordances has been gradually enriched by researchers looking into other dimensions of human actions (Barentsen & Trettvik 2002; Piccolo & Baranauskas 2010; Zhang 2008), such as experience, knowledge, motivation, emotion and culture. Such dimensions influence people’s perceptions of action opportunities and consequently are crucial in the emergence of affordances. This study integrated different concepts and varied terminology from the affordance literature (Pols 2012) and positioned them to present a view of affordances as they apply to business processes.

In addition to the Theory of Affordances, Activity Theory (Engeström 2000) provided a theoretical lens for analysing human activity in the sociocultural context of a business process. The theory considers an entire activity system going beyond just one actor and accounts for environment, history of the person, culture, artefacts used, motivations, and the complexity of real life and social activity. Under this approach, human actions within a process are influenced by multiple elements of the work environment. The actions targeted towards the object (the reason for the process taking place) are undertaken by a subject such as the individual enacting the business process. The actions are mediated through the use of different instruments (process inputs) and take place in the community (stakeholders having some interest in the process) where responsibilities are allocated through the division of effort (division of labour (DOL) and different rules are put in place.
1.2 Research Question

Discourse on business processes typically covers three areas: process design (occasionally referred to as description or planning), process analysis, and process enactment (occasionally referred to as execution) (Ould 1995). Description communicates the process to people and often takes the form of process models specifying tasks, resources, actors and their relationships (Curtis, Kellner & Over 1992), and as shown in the previous section frequently takes a structured approach. Process analysis is aimed at possible changes and improvement. Finally, process enactment involves the practices and behaviours that individuals and teams engage in while carrying out the process within the workplace. Such practices depend on individuals’ histories and experiences which in turn influence people interactions with the work environment (Olson & Carlisle 2001).

This research bridged the gap between process design and enactment utilising the concept of affordances which has the potential to make the processes more acceptable to the participants and hence more likely to be followed. People performing business processes perceive specific action opportunities. The insights gained from studying these perceptions can be employed in process planning. In other words, by considering enabling conditions in process design it is possible to facilitate the emergence of affordances and create processes more fit for action. The overarching research question is:

*How can business process design be extended to consider affordances so as to enhance participants’ perception of action opportunities during process enactment?*

1.3 Research Objectives

To successfully answer the research question the following objectives needed to be achieved:
**Objective O1:** Formulate an initial framework of business process affordances as viewed in the context of human activity within a work environment.

There was a need to understand process affordances so we could argue clear signposts encourage process enactment or reduce process bypassing. This objective was therefore aimed at answering the question 'What are affordances in the context of a business process?' and since business is considered a sociocultural environment the research also used Activity Theory as a theoretical lens for analysing human actions within a business context. This objective was required to understand the existing theories and key aspects of business processes, affordances and Activity Theory. It investigated the ways these theories apply to the business environment, as well as provided the opportunity for the development of an initial theoretical framework.

**Objective O2:** Investigate the experiences of various stakeholders regarding the processes that facilitate or hinder process enactment.

This objective aimed to investigate the experience of designing or participating in business processes in situ. Process participants as well as process designers contributed to the study. The investigation focused on exploring in-depth situations where participants enacting the process find their actions enabled or constrained by the environment. It also looked for experiences of process designers in the implementation of processes that were accepted or rejected by the participants. The focus of this objective was on action opportunities that emerged or were constrained during process enactment.

**Objective O3:** Identify how, in the view of relevant process stakeholders, the emergence of action opportunities during enactment could be facilitated through process design.

This objective investigated how process stakeholders identified in Objective 2 envisaged the ways in which process participants could be encouraged to perform suitable actions at the appropriate time. Experiences of both participants and
designers were looked at to discover how existing process design influences action opportunities and how the enabling conditions of the work environment could be improved through process design.

**Objective O4:** Synthesise the collected insights in an improved framework for understanding business process affordances and their utility in process design and enactment.

This objective focused on combining the experiences of study participants regularly performing business processes to create a cohesive framework for understanding business process enactment and action opportunities that emerge during such enactment.

**Objective O5:** Evaluate the improved framework for understanding business process affordances and its application in process design.

The final objective focused on the discussion of findings and producing a set of guidelines for business process designers to utilise the notion of affordances in the process design.

In summary, these objectives were specifically focused on determining how to design business processes so they offer obvious action opportunities to the process participants which in turn has the potential to improve process enactment. The objectives also aimed at providing a deeper understanding of the role of process affordances during enactment. Improvement of the processes from the participants’ point of view can make them more acceptable and hence more likely to be followed. This in turn has a potential to provide benefit to the business by ultimately making such processes more effective and efficient.

### 1.4 Research Success Criteria

The research will be deemed complete and the research question will be deemed answered to a high quality when the following research success criteria are met:
• the research objectives specified in section 1.3 are fulfilled
• saturation point on issues discussed with practitioners engaged in process enactment and relevant to the research question is achieved
• during the evaluation phase of the study the usefulness and applicability of the research findings is confirmed by practitioners involved in business process design.

1.5 Scope

This research looked at business processes from an information system point of view and not the business administration point of view (Weske 2012). It concentrated on improving process design and adoption of information systems and did not consider the management of other aspects of processes such as finance, human resources or economics.

The research addressed a mismatch between process design and practice by looking into how to design business processes so the people will be more comfortable with using them. It did not explore other reasons for process bypassing such as economics or age of a business process.

The study focused on improving process design for individuals enacting the processes. For this reason process enactment and process design were explored while a large area of process analysis well covered in the literature was deemed to be out of scope. To provide a better fit between process participants and the activities they perform the notion of affordances was applied. Other means of improving process design, such as process measurement to decrease the number of process violations, as researched by other academic in the past (Zazworka 2010), were not explored.

In order to obtain understanding of business process affordances, the investigation focused on stakeholders with extensive experience in business process enactment who possess deep understanding of how the design of business processes can affect
the flow of work. The study was limited to internal experts, such as employees or managers, and external experts, such as process design consultants, who engage in business processes and develop first-hand experience of both the benefits of well-designed processes and the difficulties that arise when processes are not a good fit for the particular context in which they are used.

The study involved individuals living in Australia who, as a part of western culture, brought specific attitudes and expectations to the workplace. While some participants came from different cultural backgrounds and could work for organisations operating around the world, they all currently lived in Australia and were exposed to Australian culture in the recent years.

The research dealt with business process affordances offered to people who were a part of the organisation where the investigated processes have been performed. Such process participants and the workplace where they carried on business processes were directly under the organisation’s control and could be influenced by the process design adjustments. The research did not deal with affordances offered outside the organisation, such as affordances for vendors who provided inputs used within the business process.

1.6 Motivation and Significance of Research

The study was motivated by the problems recognised in prior research. Firstly, the research on business processes affirms the continuous mismatch between process design and enactment (Bandara et al. 2007; Dobson, LeBlanc & Burgoyne 2004; Mendling, Reijers & van der Aalst 2010). Secondly, the research on affordances shows that the notion of action opportunities to guide and control goal-directed action has been applied to physical objects and artefacts (Gaver 1991; Gibson 1979; Norman 1988; Vyas, Chisaitas & van der Veer 2006; Zhang 2008) but not to business processes (Keeling 2009, 2010).

The study was also motivated by my 15 years of professional experience in implementing Enterprise Resource Planning (ERP) solutions. ERP projects are often
accompanied by business process redesign efforts and expose consultants to problems encountered within the process enactment, including the apparent discrepancy between process design and execution. This discrepancy has been confirmed across the academic and professional literature (see Section 1.1).

The study made significant **theoretical contributions** to the Business Process Management and Information Systems disciplines. Firstly, it **extended the existing body of knowledge** by synthesising the Theory of Affordances and Activity Theory to provide a framework for designing business processes. Such an approach allows us to design processes that people are comfortable to follow and offers great benefits to BPM and IS. Ultimately, utilisation of business process affordances can reduce process bypassing and increase system acceptance which in turn will provide clear business benefits by eliminating incorrect data, waste of resources and inefficiencies (see also section 1.1). Secondly, the research **confirmed the existing body of knowledge** on the suitability of using Activity System (Engeström 2000) in the context of business processes and the Theory of Affordances (Gibson 1979) in the context of a goal oriented action.

The study also **contributed to business practice** by illuminating the role of process affordances in the alignment of process design to process enactment. Discussions with study participants offered new insights into business process enactment and elucidated how affordances emerge in specific work environments. **Practitioners’ heuristics** were developed (see section 8.2) to assist designers in considering the affordances that are most appropriate for particular participants and areas of design concern thus aiding the creation of processes that are a good fit for the particular context in which they are used.

### 1.7 Thesis Structure

The initial chapter has provided an overview of the research area and stated the research question, objectives and success criteria. It also detailed the research scope before introducing the motivation behind the study and its significance.
Chapter 2 presents a review of the existing literature on business processes, affordances, and Activity Theory, all of which relate to the research objectives and increase our understanding of the research area. The review shows that the research concentrates on human actions within the business process and the influences driving such actions.

Chapter 3 deals with the methodological issues of the study. It presents the hermeneutical phenomenological approach by visiting the philosophical foundations of the investigation and discussing the rationale behind the chosen methodology. It also explains the research design with the relevant steps, methods and procedures. Finally, the chapter explains the strategies for evaluating the findings and considers the relevant ethical issues.

Chapter 4 presents a pilot study based on the implementation of an ERP system in an Australian corporate group. Reflective analysis of changes and their effects on the redesigned payroll process is undertaken. The chapter is aimed at exploring whether process improvements in the area of enactment could be explained by the emergence of new process affordances.

Chapter 5 deals with the analysis of process enactment experiences of 16 interviewed individuals. Utilising epoché and phenomenological reduction techniques the chapter addresses the researcher’s bias and determines codes and themes to prepare textural descriptions of the co-researchers’ (research participants) experiences.

Chapter 6 continues the hermeneutical phenomenological analysis employing imaginative variation techniques to look for possible meanings of co-researchers’ experiences and discover the structure in the emergence of process affordances during process enactment.

Chapter 7 synthesises the findings of the pilot study and interviews, and presents an essence of the business process affordances.
Chapter 8 evaluates the findings and builds the set of guidelines that could be used by practitioners to design processes facilitating the emergence of process affordances.

Chapter 9 concludes the study by answering the research question, exploring the fulfilment of research success criteria, describing research contributions, stating the research limitations, and suggesting future research directions.
This chapter deals with the first cycle of the hermeneutical phenomenological investigation as presented in the research design (see section 3.3). The purpose of this literature review is to summarise and synthesise the range of issues developed and discussed by academic researchers around the concepts of business process design, affordances, and Activity Theory. These notions were used in the current study, with the aim of understanding different aspects of process enactment and their application in improving process design.

In the first part, discussion on business processes is presented. A historical overview of the developments leading to the introduction of the business process approach in the 1990s is provided and a definition of business process is also offered. This is followed by a short investigation of the relationship between business processes and information systems in today’s workplaces. Finally, the concerns with prevailing technical trends in business process design and problems encountered during process enactment are described to introduce the reader to the sociotechnical approach selected for the current study.

The second part of the chapter explores the Theory of Affordances. It traces the major historical developments of the affordance concept by describing the propositions offered by different scholars since the 1970s. The specific definition of affordance as emergent properties of the actor-environment system is adopted. A synthesised model of different affordance categories for human actions (physical, functional, psychological and social) is also presented. Existing disagreement in the literature on the nature of affordances and multiple sources dealing with different aspects of action opportunities necessitated extensive discussion which makes this section noticeably longer than other parts of the chapter.

The third part of the chapter concentrates on the application of affordances to business processes. After considering the characteristics of business processes, such as the synergy between the process elements as well as process intentionality,
temporality and hierarchy, different affordance categories in the context of business processes are discussed.

The next section investigates the main ideas of Activity Theory. Historical-cultural influences of human actions are discussed and the development of a hierarchical structure of human activity is presented. The rationale for choosing Activity System as an appropriate theoretical lens to study, analyse, describe and understand the intentional actions of humans within the collaborative efforts of business processes is provided. Activity Theory is well covered in the literature and understood in academia. There are no controversies within this theory and the modern Scandinavian school (Engeström 2000) is an extension of an early Russian school (Vygotsky 1978). For these reasons the discussion on Activity Theory is less extensive, however, it does not mean the theory is less important.

The final part of the chapter synthesises the concepts of Activity System and Theory of Affordances in the context of business processes. The conceptual model linking categories of affordances to modern organisational settings (AAF model) is developed.

2.1 Business Process

2.1.1 Historical Overview

One of the first examples of business process was written in 1776 and described the production of a pin.

“One man draws out the wire, another straights it, a third cuts it, a fourth points it, a fifth grinds it at the top for receiving the head... and the important business of making a pin is, in this manner, divided into about eighteen distinct operations” (Smith 1999).

Traditionally, business process design aimed at improving management and labour efficiency by structuring and specialising businesses into distinct functional areas
(such as divisions, departments or centres) and increasing organisational productivity by breaking large jobs into smaller tasks that could be streamlined and performed repetitively (Smith 1999; Taylor 2005). This approach led to vertical differentiation and hierarchical control which split businesses into units dedicated to specific business functions, such as manufacturing, sales and warehousing.

Some researchers explored the historical developments of businesses and discovered that, when enterprises grew, their functions typically focused more and more inwardly on their specific objectives at the cost of the broader mission of the organisation (Hammer & Champy 1993). In most cases the flow of information between the divisions was poor and the efficiency of the business suffered. As control of the process moved and changed along the production chain, there was the risk of task duplication, delays, and loss of quality control. Customers’ demands for more variety, better quality and prompt delivery of products and services, which are the order of the day in a global environment, could only be achieved with highly efficient, effective and customer-sensitive operations. Functionally defined and rigidly hierarchical organisations were not flexible enough to react.

To address inadequacies of the functional model many ideas were proposed. Total Quality Management (TQM) was developed in the 1940s and became popular in the 1980s (Weilkiens, Weiss & Grass 2011). It focused on achieving business stability by providing customers with quality products and services based on the participation of all members of the organisation. In the 1970s the Activity Based Costing (ABC) method was advocated which provided a model for assigning indirect costs into direct costs (Staubus 1971). ABC attempted to identify activities that would become the inherent part of business processes in an organisation. It was not until the 1990s however that market pressures forced companies to revisit the way they worked. Rather than maximising the performance of an individual or a function, the focus shifted to designing business processes which cut through functional boundaries and aimed to achieve operational business goals. Process redesign and continuous improvement was accepted as a way of running business organisations (Zairi 1997).
While there are a few definitions of a business process that can be found in the literature, the most frequently quoted include “a structured, measured set of activities designed to produce a specified output for a particular customer or market” (Davenport 1993, p. 80), and “a collection of activities that takes one or more kinds of input and creates an output that is of value to the customer” (Hammer & Champy 1993, p. 35). Both definitions put an emphasis on how work is done within an organisation rather than what is done. Processes consist of smaller parts ordered in time and space called activities. They have clearly defined boundaries and the transformation taking place within the process must add organisational value.

While some processes result in a product or service that is received by an external customer (primary processes), others produce products that are invisible to such customers but essential to the effective management of the business (support processes) (Rummler & Brache 1995). We can distinguish three types of processes: operational, involved in day-to-day carrying out of the main business purpose such as manufacturing processes; management, related to controlling, planning and providing resources for operational processes; and strategic linked to setting the long-term goals of the business (van der Aalst 2004). Some business processes are driven by content (the information contained in the enterprise documents exchanged with different stakeholders) and some are driven by people (collaborative business processes that involve individuals) (Webster 2012).

2.1.2 Business Process and Information Systems

Significant reduction in the cost of IT made new technologies available to a wide range of businesses. This in turn has been used to reshape the way business is done by enhancing communication between corporate functions, empowering workers, and stimulating process redesign (Attaran 2004). IT is considered as the main enabler of process redesign projects and the majority of such projects will change the way businesses think about their information (Hammer & Champy 1993). Business Process Re-engineering (BPR) has been referred to as redesign of work processes in order to leverage the potential of new information technologies (Moreno 1999). The growth of ubiquitous computing in recent times (Vodanovich, Sundaram & Myers
(2010) makes workplace practices even more closely dependent on information systems.

Some researchers consider Business Process Management as an approach to design modern information systems and a way to think about a system’s behaviour (Kolar & Pitner 2012). Processes are realised in complex information technology landscapes and the integration of existing information systems is an important basis for the technical realisation of business processes (Weske 2012). One example of such systems facilitating the focus on the business processes within an organisation is ERP. These fully integrated, multi-module applications are designed to serve and support multiple business functions. They run from a single database and integrate all aspects of operations, which may include product design, manufacturing, purchasing, warehousing, sales, marketing, human resources, finance and administration. Their main purpose is to facilitate the flow of information between all parties involved (enterprise departments, customers, shareholders and authorities) which in turn facilitates the required workflow.

Access to real-time information promises large operational efficiency gains (Laukkonen, Sarpola & Hallikainen 2007). Costs can be captured more accurately and reduced with better planning, tracking and forecasting. Improved accuracy and visibility can speed the collection of accounts receivable. Increased quality and on-time delivery can improve customer satisfaction. With more efficient processes, businesses can concentrate on serving their customers, focusing on new opportunities and maximising profit.

While the existing information systems facilitate implementation of business processes in organisations, they are not ends in themselves. They are enablers assisting with deploying processes aimed at achieving the business goals. According to Gartner, business environments that seamlessly integrate with existing technologies and provide end-users with a simplified and intuitive experience by having solutions that “speak the same language,” is one of the top ten strategic technology trends for 2013 (Gartner 2012). The current study does not limit itself to the investigation of specific information systems but extends to the business
processes that use such systems. This approach looks at the business as a whole system employing business processes with all relevant resources such as people, equipment and information systems.

2.1.3 Critique of Existing Business Process Design Approaches

Business Process Design is a broad generic label encompassing a wide range of diverse activities (Wastell, White & Kawalek 1994). Process design is concerned with ensuring that processes are optimised, meaning they are effective, efficient, meet customer requirements, and support and sustain organisational development and growth (Hammer & Champy 1993). There are two main approaches to the business process design: re-engineering, aimed at one-off radical changes (Hammer 1990), and business process management, aimed at continuous evolution of the processes (Harrington 1991). The literature indicates that BPD projects often attempt radical changes but due to political, organisational and resource constraints they take on only incremental changes (Kettigner, Teng & Guha 1997).

Process design results in a process description aimed at communicating the process to people (Ould 1995). Such descriptions are often created by using modelling techniques expressing the process in graphical forms such as flowcharts and diagrams defining the desired tasks, resources, actors and their relationships (Curtis, Kellner & Over 1992). As shown in section 1.1, the mainstream view of process design is a structured one and defines the processes as activities with clearly defined inputs and outputs (Vergidis, Turner & Tiwari 2008)

Recently some academics and practitioners expressed their concerns with the prevailing technical trends in the BPD domain. Firstly, a common top-down approach to BPM neglects the contribution of individual employees who have the potential to significantly influence the value added through a business process (Balzert, Fettke & Loos 2012; De Waal & Batenburg 2014). Secondly, common standardisation of business processes can lead to undermining the very performance it is meant to optimise through decreased accountability and reduction of agility (Kolar & Pitner 2012); loss of corporate memory about the business when employees leave the
company (Challenger 1996); and workers switching to “autopilot” instead of trying to understand the specifics of each job (Hall & Johnson 2009).

Business processes involve people who bring their own understanding of the world with them and at the same time need to communicate and collaborate with others to jointly achieve their organisation’s objectives. Consequently, the effectiveness of the business process is affected by individual and social factors, and process design needs to consider such social views. Process participants do not just react to situations but enact them and make sense of them (Weick 1995). In interpreting the events around them, people are influenced by subjective factors such as identity, that is who they think they are in their context (Watson 2009), and emotions arising through confluence of a variety of situations within a business process (Stein et al. 2012). While utility of the tools used within the process is important, “meeting participant satisfaction and individual goal attainment are equally important” (Mitchell & Pollard 2014, p. 3). It is not an individual carrying on a process using the relevant instruments, it is a “social actor” never separate from the social context (Lamb & Kling 2003), getting frustrated when his actions are hindered or conflicts during interactions with others arise (Stein et al. 2012).

Human needs and abilities should not be overwritten by the search for technical competence (Nussbaum 1997). Businesses should promote more empathic, creative operations “extending human possibilities, both functionally and aesthetically” (Starkey & Tempest 2009, p. 576), and should facilitate “more inspiring designs for products, services, and processes that are both profitable and more humanly satisfying” (Krippendorff 2006, p. 579). The design challenge is to create “a more open way of relating to people and to the tasks”, to create processes that facilitate “people working more imaginatively and effectively together” (Starkey & Tempest 2009, p. 585).

Process enactment involves the practices and behaviours that individuals and teams engage in during process execution. As process participants actively interact with the work environment by using instruments, collaborating with others and building the relationships in the workplace, they will rarely be overly technically orientated,
“purely rational, goal-oriented individuals” (Stein et al. 2012, p. 2). We should not assume that the world works in preordained ways, as the possibilities of human relations are not to be found in the rules and precepts (Dewey 2002 (1922)). A “purely techno-centric design” that is too restricted risks “unforeseen consequences” (Goldkuhl 2013, p. 95), such as creating a senseless process that is non-workable in its intended context (Purao et al. 2013; Silver & Markus 2013).

Consequently, to bridge the gap between process design and execution, businesses should recognise what can be done and conceptualise how instruments including technology and people can be “woven together” (Zammuto et al. 2007, p. 753). Studies show that adoption of new technologies significantly varies (de Salas 1999). New instruments are “found to cause different changes for different work processes and different users” and these organisational consequences can be attributed to ongoing social interaction (Peng et al. 2013, p. 2526). Process description should encompass complex patterns of behaviours, cognitions, and emotions tied together with how individuals see themselves and the environment around them (Orlikowski & Iacono 2001). The existing literature on approaches that identify and resolve the human aspects that cause participants to deviate from the processes is scarce (Cunha, Antunes & Barata 2014). The current study attempts to address this problem by viewing a business process as a social artefact.

Specific tasks from a process description can be performed in many different ways, or they may even be disregarded, and subjective factors such as personality, experience and motivation will determine the individual’s actions in this regard. A well-designed business process should encourage participants to perform suitable actions at the appropriate time, preferably without conscious effort. Such compatibility between the actor and the environment could be achieved by focusing on enabling conditions and opportunities to act within a business process. The next section follows this path and presents the concept of affordances.
2.2 Affordances

Affordance is a notion that has stimulated many debates since the time it was introduced. On a general level it was defined as action opportunities in relation to a particular actor (a person performing a specific action). The current section presents major historical developments of the concept by describing the propositions offered by different scholars and adopting a specific definition of the concept.

2.2.1 Properties of the Environment versus Properties of the Actor-Environment System

In the 1960s, a psychologist James Gibson looked into how animals behave in the environment. Through his observations, Gibson concluded that animals perceive not only objects in the environment but opportunities for actions afforded by those objects. He named those opportunities affordances and describes the term this way: “the affordances of the environment are what it offers the animal, what it provides or furnishes, either for good or ill” (Gibson 1979, p. 127). Air affords breathing, a liquid substance like water affords drinking or washing, surfaces which are horizontal, flat, big and rigid afford support as animals can walk or run on them but cannot sink. If such a surface is knee-high above the ground it affords sitting. Importantly, the concept of affordances is always relational. For example, a small chair can afford sitting for a child but not for an adult.

In the 1980s, Don Norman looked into how we manage our actions in a world with a multitude of objects, many of them unknown. His observations led him to believe that the appearance of the object could provide the clues required for its proper use. When looking into the design of things he appropriated the term affordance as “perceived and actual properties of the thing, primarily those fundamental properties that determine just how the thing could possibly be used” (Norman 1988, p. 9). Norman was interested in how things can be designed so the user can infer what they afford. He was the first to apply the concept of affordance to human computer interactions, specifically to user interface design. He noticed that computer systems or their parts come with built-in physical affordances, for example a pointing device.
affords clicking. In most cases however such affordances have limited use since clicking may have no effect on the computer system. Only when a computer is turned on and a pointer is over the specific object on the screen, for example a button, can a particular function like printing be executed. Software application designers have no influence over physical affordances but they can control perceived affordances by creating objects on the screen that make the affordance of clicking more noticeable.

For more complex actions, there may not be enough information available for an actor to infer possible action opportunities. In such cases, an easy exploration option should be designed in to enable discovery of affordances. In the context of system design, the system will be easy to use only when attributes of the objects relevant for action are available for perception, as only such affordances offer a direct link between perception and action. When affordances are hidden or false, they lead to mistakes and misunderstandings. Good interfaces should guide attention via well-designed groups of sequential steps, revealed over time or nested within groups (Gaver 1991). For instance, clicking on the ‘File Menu’ leads to information indicating a new affordance of ‘Save As’ or ‘Copy’. ‘Cut’ and ‘Paste’ functions are available from the ‘Edit’ menu. A model explaining the relationships between affordance and perceptual information is presented in Figure 2.1:

![Figure 2.1: Affordances and availability of perceptual information](adopted from Gaver 1991, p. 80).

Affordances point to the complementarity of the environment and the actor, and while they are considered as properties of the environment (Gaver 1991; Gibson 1979; Norman 1988) at the same time they are related to the actors’ capabilities.
Some academics stressed the importance of an actor’s body size as only objects comparable to such size afford certain behaviours: they can be shaped, lifted, carried, grasped or thrown. A set of steps which rises 120 cm high affords climbing for an adult but not for an infant (Gibson 1979; Warren 1984). Others emphasised the observer’s mental and perceptual capabilities (Norman 1988). This conflicts with Gibson’s position that affordances are all action opportunities, regardless of the individual’s ability to recognise them. For the latter group of academics, affordances “result from the mental interpretation of things, based on our past knowledge and experience applied to our perception of the things about us” (Norman 1988, p.219).

The trend of defining affordances as properties of the environment continued until the 1990s when new approaches inspired by physics and biology were suggested. A proposition to treat affordances as dispositional properties of the environment, meaning properties demonstrating themselves only when paired with enabling conditions (labelled as “actualising circumstances”), was put forward (Turvey 1992). In physics, such properties exist independently of the observer (primary properties) but manifest themselves through other things. For example, the solubility of sugar can actualise only when a solvent is present. Under such a definition, the affordance of “being catchable” is a property of an object in the environment only if there are actors that are capable of catching the object. Affordances as dispositions depend on the presence of actors that can actualise them. As such they must be complemented by the dispositional properties of actors, so called effectivities, which are abilities that allow the actor to use affordances. In the absence of the complementary properties of animals the properties of the environment are not affordances.

Until around 2000, academics looking into affordances explored the perceptual relationship between the environment and the observer but left actual interaction unexplored. Addressing this gap led to the developments which gradually shifted the view on the affordance concept.

As animal actions can fail even though all the conditions are right, affordances cannot be defined as dispositional properties which never fail. For example, sugar will always dissolve in water in the right conditions but an animal can fall down even though it is
able to walk and the conditions for walking are ideal. Affordances are offered not by the properties of a specific object but by the situation in the environment that cannot be assigned to an object. Affordances are therefore relations between the abilities of animals and features of the environment which afford behaviour (Chemero 2003).

According to the broadly accepted principles of Cartesian dualism, human cognition is separated from the world in which it originates. This makes the relational concept of affordances problematic. While Gibson’s idea was to capture complementarity between a world and an actor, the dualistic ontology allows only their assignment to properties of the environment or to subjective interpretations of the actor. There is no place for properties that exist only when the actor acts on the environment. The environment properties are not affordances but they may become such when some actor relates to them in their activity. Affordances are relationships that are physically, socially, and culturally constructed between the actors and the artefacts in the lived environment. As such users are continuously interpreting the situation and constructing meanings about the artefacts. Affordances therefore arise from properties of artefacts that are pertinent to the actor’s activities. Such activities are integrated with and adapted to the environment, consequently affordances are realised only when an actor acts in an environment. Affordances emerge from interactions, they are properties of the activity system (Barentsen & Trettvik 2002).

The definition of affordances adopted in this thesis will follow the recent formulations and will treat affordances as emergent properties of the actor-environment system. That is, “affordances do not inhere in either the animal or the environment, taken separately, but emerge only out of relations between the animal and environment” (Stoffregen 2004, p. 80). Further, the affordances which emerge for a particular actor in a given context depend on the goals and interests of the actor at that moment. The ability to form and realise one’s goals, referred to as human agency (Giddens 1984), allows people “at any moment and within existing conditions (...) to choose to do otherwise” (Orlikowski 2000, p. 412). Human agents can exercise their discretion to shape the effects that the environment, including materials and technology, has on their actions (Azad & King 2008; Vaast & Walsham 2005).
2.2.2 Affordances for Human Action

Gibson looked into the behaviour of animals and focused on simple physical operations such as walking, running, sitting and grasping. When it comes to humans, the repertoire of actions is much broader and include many other elements, beyond just physical capabilities, that drive and influence what we do. For example, when I see a car parked on the street with the key in the ignition, from the standpoint of a motor action it affords driving for me but from the standpoint of action in a social context it does not as I am not the car owner. A comprehensive theory of human action opportunities should therefore include all dimensions of our actions. Since the 1980s such dimensions were progressively added to the notion of affordances.

A review of the literature, specifically works related to human-computer interaction, indicates a clear and gradual trend to expand the notion of affordance with cognitive and social characteristics such as human experience, knowledge, motivation and culture.

Figure 2.2 presents a historical summary of authors looking into the concept of affordance and different categories and subcategories explored by them (Barentsen & Trettvik 2002; Costall 1995; Gaver 1991; Gibson 1979; Hartson 2003; Mathiesen, Bandara & Watson 2013; McGrenere & Ho 2000; Norman 1988; Piccolo & Baranauskas 2010; Pols 2012; Rozycki, Keller & Cybulski 2012; Seidel & Recker 2012; Vyas, Chisaitas & van der Veer 2006; Zhang 2008).
Figure 2.2: Historical summary of authors researching different affordance categories and subcategories.
To make sense of these expanded notions of affordance, a conceptual model was developed from a thematic analysis of the literature. The model positions five major categories of affordances between the two axes labelled as human dimension and environmental dimension in Figure 2.3. This is important since affordances are essentially relational, as Gibson put it: an affordance “is equally a fact of the environment and a fact of behaviour” (Gibson 1979, p. 129). The human dimension is divided into individual and group since some affordances occur as a result of the relationship between the properties of an individual and the environment, and some occur as a result of properties of a group and the environment. The environment dimension in the model encompasses the entirety of the world we live in. It includes both physical objects and human activities. The conceptual model differentiates between environmental elements that are material (labelled physical) and those that are not (labelled abstract). Between these two axes each of the five major categories of affordances are positioned depending on their primary area of application or concern. These categories are explained next.

**Figure 2.3: Two-dimensional model of affordance categories and subcategories.**

**Physical Individual affordances** relate to the biological limitations of individuals. These include: manipulation affordances, related to handling an object with our
body, such as grasping; nutrition affordances, related to using an object for nourishing our body (Gibson 1979); locomotion affordances, related to changing our location (Gibson 1979); and sensory affordances, related to our sensory actions, such as seeing, hearing, touching and tasting (Hartson 2003). Physical Group affordances are derived from the constraints imposed by our environment and are more applicable for groups of people, which can make possible some action that was not afforded to the individual. These include: manufacturing affordances, related to developing environment substances into different objects; layout affordances, related to spatial arrangements of objects in the environment (Gibson 1979); and operational affordances, related to physical manifestation of our actions (Barentsen & Trettvik 2002). Physical affordances determine what we humans are physically able to do.

**Psychological affordances** pertain to the abstract aspects of our actions as individuals. They are influenced by our intangible capabilities. Psychological affordances include: perceived affordances, which are related to our perceptions (Norman 1988; Piccolo & Baranauskas 2010); cognitive affordances, encompassing our cognition, for example learning (learning affordances), awareness of time (time affordances) or remembering (mnemonic affordances) (Hartson 2003); emotional affordances, related to our reaction to the important events in our lives (Zhang 2008); and motivational affordances, related to supporting our motivational needs (Barentsen & Trettvik 2002; Piccolo & Baranauskas 2010; Zhang 2008).

**Social affordances** relate to our lives within a social group. As we actively participate in building relationships with others and maintaining interpersonal interactions, our actions are influenced by social structures, conventions and group dynamics. Social affordances discussed in the literature (notably some cover similar ground) include: cultural–historical affordances, related to adapting objects to suit our social needs (Barentsen & Trettvik 2002); interactional affordances, which concern social relationships around us (Pols 2012); instrumental affordances, focusing on goals shared with others (Barentsen & Trettvik 2002); and practice affordances, related to the practices used within the group (Vyas, Chisaitas & van der Veer 2006).
Functional affordances relate specifically to man-made artefacts designed with a specific function in mind and overlap the categories described so far as all such categories contribute to the creation of opportunities for realising a specific purpose (Gaver 1991; Hartson 2003; McGrenere & Ho 2000; Pols 2012). Functional affordances include: use affordances related to what the user can do with the artefact, for example a computer affords writing a document (Pols 2012); canonical affordances related to the standard role of the man-made object, for example a canonical affordance of a printer is to print documents (Barentsen & Trettvik 2002); and artefact affordances related to the user’s interpretations while interacting with the artefact, for example a specific functionality within an information system can be activated in different ways, for instance a keyboard shortcut or a mouse (Vyas, Chisaitas & van der Veer 2006). In the human computer interaction domain, functional affordances are often sequential in time or nested in space (Gaver 1991; McGrenere & Ho 2000). Such opportunities can be revealed upon a trigger of a low-level action, which via a chain of interlinked affordances, may lead to the execution of a high-level and functionally meaningful action. For example, the main objective of pressing a print button in a typical software application is to print a document. While a button has a physical affordance of push-ability, it also has the functional affordance of print-ability.

After introducing the concept of business process and affordance we turn now to arguments towards combining both notions and exploring business process affordances.

2.3 Business Process Affordances

In the context of business processes, human activities happen spontaneously and stand-alone or they happen in a sequence of actions aimed at some objective. It is only when the series of actions are purposefully integrated that the business process comes to life. Such processes are usually formalised, meaning they are intentionally designed with the specific objective in mind and bring together the steps to be performed, the inputs used, and the subjects enacting them.
As different business process steps are synchronised toward achieving the predetermined goal, human actions can only make sense when you look at them in the context of a whole process. The relationships between process elements create synergy making the whole process greater than the sum of its parts (Laughlin 2005). With effective teamwork and social interactions developed during the pursuit of purposeful activity, synchronised output of the process is produced, rather than just an aggregated response (Houghton & Ledington 2007; Paris, Salas & Cannon-Bowers 2000).

Unique combined effects of the process give rise to emerging properties providing human action opportunities, in other words process affordances. For example, in the process of providing dental care to a patient, the dentist utilises their knowledge, uses the required instruments and consumes the required materials. The process inputs (instruments and materials) are meaningless when there is no dentist that knows how to use them. At the same time the dentist with all the relevant knowledge cannot provide the treatment when the instruments (dental chair, drills, etc.) are not working. Even with the dentist and instruments readily available, the dental care may not be provided when there is no nurse to assist in the procedure. Finally, even the dentist, nurse and instruments count for nothing without the patient to be treated. The process cannot simply be reduced to its components because the relationships between those components will be lost. Additionally the order of the steps undertaken within the process matters and if it is changed the objective may not be met. Therefore, when looking into action opportunities presented by a process, we need to view such a process in its entirety, including steps required, subjects involved and instruments used.

Another argument supporting the idea of process action opportunities relates to the nature of an artefact. An artefact is a separate and identifiable entity with some enduring existence, made for a certain purpose, with intended proper functions and used in a context to contribute to some goals (Goldkuhl 2013; Rudder Baker 2008; Simon 1996). An artefact can be a specific object, such as the Great Pyramid; a type object which can have many instances, for example the Bible; an instance of a type such as a particular Bible; or an abstract object, for example an artificial language
(Hilpinnen 2011). The concept of affordance is not therefore limited to physical objects or technology and may include abstract objects, for example “social structures such as resources of authority, norms governing organisational conduct and hierarchical status, and people’s knowledge about the methods and procedures” (Finnegan & Currie 2010, p. 157). Some types of artefacts incorporate relationships or interactions between or among individuals and these interactions directly relate to purposeful activities (Lee, Thomas & Baskerville 2013). The business process is clearly in that category.

The process is always designed and exists regardless of people enacting it, so it clearly satisfies the definition of an artefact, and as affordances were applied in the design of objects and artefacts (Keeling 2009), utilising the concept for processes seems to be a natural step. There is nothing preventing us from treating a process as an artefact since it has productive intention, meaning it has been intentionally made for some purpose. Our argument can be supported by the treatment of such processes by the US Patent Office which will grant patents for a process just as it will for any physical invention (Legal Information Institute 2010).

Consideration of the possible affordances of the process as a whole presents an opportunity to encourage a goal-oriented action in a desirable direction (Keeling 2010). Such affordances will emerge out of the properties of the process (e.g. it has certain steps and requires certain activities and inputs), properties of the participants (e.g. that each has the skills and knowledge necessary to run their own portion of the process), and properties of the group of persons (e.g. that they have the social communication skills necessary to coordinate operation of the components of the process). In other words, affordances will emerge from interaction between properties of process inputs and process participants’ intention.

Recently social affordances of technology were discussed in the literature (Mathiesen, Bandara & Watson 2013) and many such affordances could emerge in business processes where social technology is used. The affordance of participation can arise when the business process is designed to enable the participation of actors. For example, social technology used within a process, such as Yammer, allows
different process participants to engage in discussions about workplace processes which in turn may increase innovation by utilising the wisdom of the crowds (Surowiecki 2004). Affordance of collective effort can emerge when the process supports “collaboration activities in a shared context” (Abbate & Coppolino 2010, p.5). For example, teleconference systems allows process participants to collaborate and exchange knowledge with others regardless of geographic location. Affordance of transparency may result from processes that are designed to make decisions and events more visible to the affected stakeholders (Treem & Leonardi 2012). This in turn may allow process participants to be more aware of process objectives and thus what actions to take in the process. Affordance of independence can arise from processes where participants can contribute independently and do not have to modify the content of previous contributors (Treem & Leonardi 2012). For example, plug-in architecture software projects allow a specific programmer to code independently of other process participants. Finally, affordance of connectivity can emerge in processes which support the tasks of collaborative discovery (McLoughlin & Lee 2007). For example, access to the corporate business process database allows the process participant to apply solutions that have been tested in other branches of the organisation.

The concept of affordance started to gain some popularity among academics researching business processes in recent times. Some looked into action opportunities offered by business process models in system analysis and designing tasks (Eike & Recker 2013) while others explored action opportunities offered by information systems used within processes to make such processes environmentally sustainable (Seidel & Recker 2012). There is, however, no investigation addressing a problem of process bypassing. This is the purpose of current study.

The affordance concept emphasises the relationship between the human dimension and the environment dimension. However, a single business process may be enacted across many different geographical locations. It may involve numerous stakeholders, each with different expectations, requirements and intentions, and it may utilise many inputs to produce outputs, all of which needs to be considered in order to
design the process in such a way that it could offer affordances to the process participants.

Two promising approaches of conceptualising this complexity are Stakeholder Theory and Hierarchy Theory. Stakeholder Theory emphasises stakeholders’ needs, expectations, power, interests, as well as the process impact on the stakeholders and their environment (Freeman 2010). Hierarchy Theory enables us to distribute the process across levels of organisational abstractions (however, note the previous remark on the irreducibility of a process wholly into its components) (Allen & Starr 1982). While both theories have the potential to facilitate understanding of process complexity Stakeholder Theory does not describe process participants’ tasks and responsibilities while Hierarchy Theory is particularly well suited to assisting consideration of affordances offered to participants at a task level.

Hierarchical distribution of activities and assignment of such activities to specific actors within the process design is important, as affordances, being relational, will present different opportunities at different levels of the process. For instance, a high-level business process is composed of sub-processes, which in turn have their own sub-processes, and so on until we reach the lowest level of specific operations assigned to specific people. Figure 2.4 illustrates the high-level process of a customer sale and three sub-processes being part of that process.
Figure 2.4: Customer sales process with sample sub-processes.
In hierarchic systems, we can distinguish between the interactions within subsystems and among them (Simon 1962). Our example of the customer sales process will include interactions between the purchase clerk and the manager within the purchase order processing sub-process, but also interaction between the purchase clerk and warehouse staff in the form of a message that the goods were ordered and are to be delivered.

Another important process characteristic that needs to be taken into account when looking at process affordances is temporality. Activities are performed in time and to achieve the desired goal they often have to be enacted in a specific order, although there may be exceptions for some actions that do not have to follow a specific sequence. Our sample sale process always starts with a customer making an order and ends with receiving a customer payment. Following a temporal and sequential pattern within the process brings about sequential affordances posited by Gaver for complex actions (Gaver 1991). For example, a customer order recorded in a system will trigger a message that goods need to be manufactured and thus create a perceived affordance for the manufacturing department to start the production.

After considering the characteristics that will affect process affordances, I now consider different affordance categories in the context of business processes.

**Physical affordances** may emerge when process participants use physical instruments, such as keys on the computer keyboard that need to be pressed (manipulation affordances), a forklift that takes you from one place in the warehouse to another (locomotion affordances), goods that can be further used in the manufacturing process (manufacture affordances), or sound played by the forklift when it drives backwards (sensory affordances). A good example of physical affordances illustrating the advantage of looking into the whole process rather than just the parts, is layout affordance. Each process step considered separately can afford efficient action but it is only when we consider the whole process that we can discover that the layout can be improved to facilitate the sequential activities of the process.
In the context of business processes, **psychological affordances** may emerge when process inputs, including information systems, are designed so the desired actions are easy to perceive and learn (perceived and mnemonic affordances); the workplace has an aesthetic appearance (emotional affordances); and clocks are installed to make employees aware of time so they are motivated to speed up the work and finish it on time (time and motivational affordances). While psychological affordances are very subjective, some commonalities can be noticed. For example, sociotechnical academics argue that performing a repetitive low-level action will demotivate people while executing multiple actions building up the business process increases motivation (Mumford 1994). Another good example of psychological affordances illustrating the advantage of looking into the whole process rather than just the parts is learning affordances. Training on a separate process step will never provide us with the knowledge of how this step fits together with other steps within the whole process.

**Social affordances** will emerge when people interact with each other during the process. Examples include: a purchase clerk requesting authorisation for a purchase order from a manager (interactional affordances); internal training on the process, making individuals aware of goals shared with others (instrumental affordances); team meetings that make individuals feel part of the group and motivate them to work towards the process objective (motivational affordances). Business process participants usually communicate and coordinate their actions by talking to each other, observing each other’s work, or interacting through technology to exchange the relevant information. The technology used within the processes often supports a work group rather than just a single user/single task (Dillon 2000). The involvement of people and teams within the processes is the social context that facilitates social affordances. A specific process step considered separately can provide social affordances for multiple individuals from the team performing the task. However, an additional layer of social action opportunities emerge when the team has to collaborate and communicate with other teams contributing to the process and enacting their own tasks. In our customer sales process example, humans working in the five teams involved: sales, manufacturing, purchasing, warehouse and finance had to communicate to achieve their own goals.
Finally, **functional affordances** will provide the opportunity to achieve specific goals such as printing a purchase order to be sent to the vendor, unloading a warehouse delivery with a forklift, or using an information system put-away module to generate a put away document for a forklift operator. Some functional affordances will emerge across the process but not its separate parts. For example, recording the sale in an information system will not provide perceived affordances for the manufacturing team unless the system is set up for process workflow and automatically sends the message to the manufacturing floor to start the production.

A business process is much more than a list of activities to be performed to achieve a business objective. Humans engage in business processes to achieve business goals and their actions are driven by the way such processes are designed. Ultimately it is the process that shapes the action opportunities of its participants through combining physical and intangible elements of the business environment. In the business setting, the business processes determine what we do. The tools, such as materials, equipment or information systems are only used to advance the process. In other words, while specific tools can facilitate our actions they rarely drive them. Norman’s famous statement that we do not want to use a computer, we want to accomplish our tasks (Norman 1990) comes to mind.

To achieve a greater compatibility between the environment and the actor, humans must be seen as an integral part of the environment that facilitates or hinders their actions. Business process design needs to take into account not only the intended process and its objectives by considering the required inputs but also the use context, including process participants and their competencies and motivation (Alter 2006). The concept of affordances, created to bring both the actor and the environment closer together, can take on the role of “a direct link from the design to the work context” (Goldkuhl 2013) and expand the design towards situation, organisation and user driven approaches (Purao et al. 2013). Focusing on action opportunities has great potential to improve design in many areas by highlighting individuals’ needs and capabilities. Considering business process affordances may help us better understand how processes work and facilitate the creation of processes that are more appropriately fit for action.
The meaning ascribed to an affordance always needs to be specified in relation to the context, which in turn is implied by the individual’s history of learning and knowing. In other words, “the affordances that are available to be perceived by an individual over time, reflect an interweaving of reciprocal, continuing, historical processes” (Heft 2003, p. 177). Culture is also important as it lends meaning to our everyday behaviour and “shapes the way we perceive unfamiliar artefacts, confront challenges, solve problems and adapt to the new environment” (Peng et al. 2010).

Therefore, when considering the affordances of business processes the focus needs to be placed on the relationships between an individual and the environment where the processes are performed. Such an environment includes physical and non-material aspects. Hence, Activity Theory, which stresses the historical–cultural influences and looks into socio-organisational context of human activity (Leontiev 1978) is used as a conceptual lens to investigate business processes.

2.4 Activity Theory

Activity Theory has its origins in 1920s Russian psychology research where Lev Semyonovich Vygotsky, Alexander Luria, and Alexei Nikolaevich Leontiev developed various propositions about the nature of human activity. It encompasses multiple social sciences theories aimed at understanding human activities as complex, socially situated phenomena. The theory considers an entire activity system going beyond just one actor and accounts for environment, history of the person, culture, artefacts used, motivations, and the complexity of real life and social activity. Activity Theory "focuses on practice, which obviates the need to distinguish 'applied' from 'pure' science — understanding everyday practice in the real world is the very objective of scientific practice" (Nardi 1998). Activity Theory is a descriptive rather than prescriptive theory with sociological and historical elements. Business processes are enacted within a sociocultural context. Hence, Activity Theory will be used in the current study to provide a theoretical lens for analysing human actions within the business process. A theoretical lens is required to guide the study to ensure that different aspects of human actions are included in a model of business process action opportunities. Activity Theory is a well know and recognised theory that has been
applied in workplace settings and can therefore provide a theoretical framework for my study that will explain affordances in the context of business processes.

The next section explores different levels of human activity proposed by the Russian school in the 1920s (Leontiev 1978) and different elements of Activity System proposed by Scandinavian academics in the 1980s (Engeström 1987).

2.4.1 Human Action Levels

Activity Theory seeks to describe human activity as it evolved through millennia. Initially, personal motivations revolved around survival but gradually communal life and intentional action emerged. Alongside our biological evolution, our capacity for reflection of the relevant features of the world evolved. In the beginning human activity focused on making and using tools. Gradually tasks started to be divided between group members and specific activities had to be directed towards goals. The hierarchical structure of activity-action-operation, presented in Figure 2.5, was established by Leontiev (Leontiev 1978).

![Figure 2.5: Activity levels (adopted from Leontiev 1978).](image)

In the following section, examples from a payroll process will be used to illustrate the hierarchical nature of human actions within processes.
Activities are units of analysis and represent systems with their own internal structure and transformations. They relate to why we do things. Activities connect the individual with the culturally and socially rich environment and are oriented towards human motives that are often collective. Each motive is an object, material or ideal, that satisfies a personal or social need. While motives do not have to be conscious, they largely relate to the personal conception of the ‘self’. For example, while the organisational motivation for a payroll process is to provide their employees with pay for the work done, a payroll manager’s motivation is likely to be (at least in part) to comply with their position’s duty statement and thus to regularly and efficiently execute payroll runs.

Actions that realise activities are defined by our conscious intentions, are goal directed and relate to what we do. People engage in actions that do not directly satisfy a need, but contribute towards the ultimate satisfaction of such a need. For example, a goal of a specific action for an admin clerk may be processing the timesheet, which on its own is useless. It is necessary however in the whole payroll activity to ensure that employees are paid correct amounts for their work.

Operations execute actions according to the specific conditions in the environment and relate to how we do things. Operations are typically unconscious (Leontiev 1978). For example, a specific operation for a payroll clerk may be data entry on the timesheet screen of the information system, which as an instrument will become part of operational conditions.

The differentiation between motives, goals and conditions is critical for predicting human behaviour. When operations are frustrated, people often ignore such difficulties and adapt. When a goal is frustrated, people without much effort set a new goal. When a motive is frustrated, people are upset, and their behaviour is unpredictable. The system of human activity is a dynamic one and constantly develops (Engeström 2000). People may lose motivation for some activities and these may become actions, and some actions carried out frequently under similar conditions may become operations as conscious control will disappear (Barentsen & Trettvik 2002).
The distinction between motives, goals and conditions of human actions can be utilised in the context of affordances. Different categories of affordances can be seen to link up with the specific levels of an activity structure as presented in Figure 2.6. Activities oriented towards human motives, that satisfy a personal or social need, are connected to psychological affordances, which pertain to abstract aspects of our actions as individuals; and social affordances, which relate to our lives within a social group. Human individuality and society decide the motivation behind our activities. Actions that are conscious and goal directed connect to functional affordances contributing to the creation of opportunities for realising a specific purpose. Operations are executed according to the specific conditions in the environment and relate to physical affordances, which are determined by the constraints imposed by our bodies and environment.

Figure 2.6: Affordances for activity levels
(adopted from Leontiev 1978).

Involvement of multiple individuals in process enactment or usage of process outputs, make business processes a collective effort. The crucial difference between an individual action and a collective activity explicated by Leontiev was used in the further development of Activity Theory, and more specifically the Activity System which is described in the next section.
### 2.4.2 Historical Development of Human Action into Activity System

All human activity is a process of social interaction within a particular historical and cultural context and an individual’s actions can only be analysed and understood within that context (Vygotsky 1978). Originally human motivation for action in the world evolved around survival. Gradually individuals started to organise themselves in groups. In time, historical development of human society introduced evolutionary changes (presented in Figure 2.7) through the emergence of specific elements that affect what and how we do things in the world. Those changes resulted in the creation of the Activity System presented in Figure 2.8, where human interactions within the environment are not direct but mediated through the use of tools (Vygotsky 1978). The notion of instrumentation of human activity is underpinned with the need to transmit social knowledge and influence the nature of behaviour. The history of communal life provides a backdrop for understanding community interaction, the use of laws, power and division of labour.

![Figure 2.7: Structure of activity in transition from animal to man](adopted from Engeström 1987).

![Figure 2.8: Activity System](adopted from Engeström 2000).
Knowing all the elements of an activity system (Engeström 2000) is necessary to have a deep understanding of the activity in question. These elements are shown in Figure 2.8. In the business context, the actions are undertaken by a subject such as the individual or team enacting the business process. An example may be the operational manager responsible for manufacturing, or staff operating manufacturing equipment. Actions are targeted towards the object being the reason for the process taking place, for example the effective and efficient manufacturing of a specific product. The relationship between the subject and the object is mediated through the use of physical and conceptual instruments, such as equipment, software or chemical formulas used within the process. The business process takes place in the community, including stakeholders having some interest in the process, such as subjects enacting processes, customers using process outputs, vendors providing process inputs, business owners earning the return on investment, and in some cases the public exposed to the effects of the process. Responsibilities within the process are allocated through the division of effort incorporating process workflow. A process is subject to different rules encompassing explicit regulations, organisational policies and procedures, and implicit cultural norms. Finally, the outcome of a process is the effect of the activity system and results from some transformation. For example, the outcome of a manufacturing process is a finished product.

2.5 Business Process Affordances through the Lens of Activity Theory

The current study looks into human actions within business processes. As explained in section 2.1, such processes are usually intentionally designed with a specific objective in mind, they potentially involve multiple stakeholders and are enacted within a specific physical and social context. These characteristics of the process make Activity Theory well suited as a theoretical lens to study, analyse, describe and understand the intentional actions of humans within the collaborative efforts of business processes. The approach of using Activity Theory in workplace settings was advocated by other academics in the area of system design, health, sales, marketing, training and management (Bardram & Doryab 2011; Bødker 1990; Hasan & Gould
Different elements of the activity system are clearly visible in business processes. For example, subject corresponds to a specific participant or a team enacting the process; object relates to the process objective; instruments match up to process inputs; community links to process stakeholders (enactors, customers, vendors, owners and sometimes the public); division of effort parallels division of labour; and finally rules reflect regulation and norms built into the processes. The links between different elements of the activity system and specific aspects of business processes can be used to deepen our understanding of work and people engaging in such work. Activity Theory enriches our research with the whole context of the processes including individual and social levels interlinked at the same time (Kuutti 1996).

The Activity System can help us better understand human actions within the process and hence can be useful in exploring what facilitates or constrains such actions, in other words business process affordances. The design of business processes influences human motivation, goals and the business environment by affecting both tangible and intangible aspects of that environment as they relate to specific individuals or groups. To reap the benefits of a good process design, we need to ensure that all aspects of human behaviour, such as operations, actions and activities, are taken into account and all categories of affordances, such as physical, functional, psychological and social, are duly considered. Business processes occur in the complex sociocultural context of a business environment, and Activity Theory is the language of “what people do in context” (Mwanza 2001).

From a synthesis of prior research, a conceptual model linking categories of affordance to modern organisational settings was developed. Table 2.1 lists concepts in Activity Theory and corresponding concepts in Theory of Affordances as well as the applicable business process context. This is followed by a graphical representation of the table (see Figure 2.9) and detailed discussion of the proposed model.
Table 2.1: Corresponding concepts of Activity Theory and Theory of Affordances.

<table>
<thead>
<tr>
<th>ACTIVITY THEORY (section 2.4.2)</th>
<th>THEORY OF AFFORDANCES (section 2.2.2)</th>
<th>BUSINESS PROCESS CONTEXT (section 2.1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject</td>
<td>Actor performing an action in the environment</td>
<td>Individual or team enacting the business process</td>
</tr>
<tr>
<td>Object</td>
<td>Psychological aspects of the environment enable or constrain a specific action. For example, a person will put a product on a shelf 4 m high if he is motivated to do so (i.e. he earns a salary for putting the product away or he needs to move a product from the current place).</td>
<td>The reason for the process taking place, for example the effective and efficient manufacturing of a specific product</td>
</tr>
<tr>
<td>Instruments</td>
<td>Material aspects of the environment around an actor enable or constrain a specific action. For example, a person cannot put a product on a shelf 4 m high unless he can use a forklift.</td>
<td>Process Inputs (such as equipment, software or chemical formulas) are used to produce process outputs.</td>
</tr>
<tr>
<td>Community</td>
<td>Functional (i.e. rules established to achieve a specific function) and social (i.e. division of effort scheduling responsibilities for different members of the community) aspects of the environment around an actor enable or constrain a specific action. For example, a person can put a product on a shelf 4 m high only when he has a license to operate a forklift (rules) and has an access key to a forklift (division of labour).</td>
<td>Collaboration (i.e. members of the same team) and interactions (i.e. process subject and customer) between different process stakeholders.</td>
</tr>
<tr>
<td>Rules</td>
<td>Social aspects of the environment around an actor, such as rules established within a community to achieve a specific function, enable or constrain a specific action. For example, a person can put a product on a shelf 4 m high only when he has a license to operate a forklift (issued by the relevant authority).</td>
<td>A process is subject to explicit regulations (i.e. Income Tax Assessment Act), organisational policies and procedures (i.e. wearing particular uniform during work), and implicit cultural norms (i.e. setting a workplace in Japan in a particular way).</td>
</tr>
<tr>
<td>Division of Effort</td>
<td>Social aspects of the environment around an actor enable or constrain a specific action. For example, a person can put a product on a shelf 4 m high only when he has an access key to a forklift (determined by the division of labour).</td>
<td>Responsibilities within the process are allocated through the division of labour incorporating process workflow.</td>
</tr>
</tbody>
</table>
Environment and instruments (process inputs) are used by the process subject to affect the objective of the business process and provide physical affordances to the process subject (triangle A in Figure 2.9). Such affordances relate to what we humans are physically able to do, and to the biological limitations of individuals and the constraints imposed by the environment (Gibson 1979). For example, a manufactured product weighing 15 kilograms can be carried by an employee while one weighing 75 kilograms cannot.

Various process rules applied by the business community (process stakeholders) have functional purpose, as subjects need to acquire them and use them in their action planning (triangle B in Figure 2.9). Such affordances relate to man-made artefacts designed with a specific function in mind and aimed at realising a specific purpose (Gaver 1991; Pols 2012). For example, the Income Tax Assessment Act 1997 has to be followed in the payroll process.
Psychological affordances emerge between a process subject, objective and stakeholders (triangle C in Figure 2.9). Such affordances pertain to the abstract aspects of our actions and are influenced by our intangible capabilities such as perception, cognition, emotions or motivations (Norman 1988; Zhang 2008). One example is that training can make individuals feel part of the team and motivate them to work towards the process objective.

Finally, division of labour can provide social affordances to the subjects (triangle D in Figure 2.9). Such affordances relate to our lives within social groups with their structures, conventions and dynamics (Pols 2012; Vyas, Chisaitas & van der Veer 2006). For example, the authorisation of purchase orders requires interaction between the purchase clerk and the manager.

All elements of the AAF model are highly interrelated, which reflects the complementarity of the subject and business environment and is represented by the overlapping areas of different affordances. For example, physical affordances are determined by the process subject, objective and inputs but they are also contributed to by the process stakeholders which set different rules and responsibilities on how to use or access the equipment. For instance, an employee can only use the forklift when he has a licence to operate such machinery (rules) and has an access key to a warehouse where the forklift is located (division of labour).

Social affordances are determined by the process stakeholders, objective and division of labour, but they will also be influenced by process inputs and rules. For example, the business environment offering social affordances to the subject will be influenced by information systems enabling collaboration between different parties (process inputs) or the schedule of working hours (process rules). For instance, an ERP purchase module allows process participants to be in touch regardless of geographical location, and the purchase manager can approve the order prepared by the clerk in a different office.

The Affordance/Activity Framework (AAF) presented in Figure 2.9 attempts to identify different elements of the activity system with corresponding process
components and their influence on process affordances. This hypothetical model is based on reconciling two different areas of knowledge, Theory of Affordances and Activity Theory, and while it indicates where affordances can present themselves, it does not explain in detail what aspects would facilitate the emergence of those affordances. The conceptual model will be evaluated by verifying how elements of the framework are going to work in practice. The empirical part of the study will therefore concentrate on exploring process enactment in order to determine: what people perceive as important when specific process affordances emerge and what actually happens during the enactment. Such an approach will help to determine what brings about the emergence of process affordances and how such affordances can be incorporated in the process design which ultimately will answer the research question.

2.6 Chapter Summary

From the literature review on business processes and Activity Theory I concluded that a business process can be treated as an activity system where human subjects participate in a historically–culturally developed activity to achieve specific objectives. These objectives are achieved by performing actions mediated by specific process inputs, following established process rules, and sharing the division of labour with other process stakeholders.

From research on human actions I adopted the Theory of Affordances focusing on enabling conditions and opportunities to act within a specific environment and applied it in the context of business processes. I inferred that different elements of an activity system can facilitate or hinder the emergence of specific affordance categories and suggested the Affordance Activity Framework discussed in section 2.5 and presented in Figure 2.9. In the proposed framework, physical affordances are influenced by process subject and inputs, functional affordances by process subject and rules, psychological affordances by process subject and stakeholders, and social affordances by process stakeholders and the division of labour.
Synthesising Activity Theory and Theory of Affordances allowed me to establish specific aspects of business processes and its rich sociocultural context that play an important role in process enactment. Chapters 4, 5 and 6 will present the empirical part of the research and investigate experiences of individuals enacting business processes to validate the literature review approach and explore other factors that may be of significance for human actions performed within business processes. Subsequently, chapter 8 will evaluate the study by discussing the findings of the literature review and empirical research to investigate the ways the proposed framework can be used in business practice.
3 METHODOLOGY

As discussed in Chapters 1 and 2, the current study focused on determining how to design business processes so that they can offer immediate action opportunities (affordances) to the process subjects. This in turn can facilitate the improvement of the processes from the participants’ point of view, by making the processes more acceptable and fit for action.

This chapter presents methodological issues related to the study. The first part presents the summary of the research problem, research question and research objectives. This is followed by a section investigating the philosophical foundations of the study and a discussion of the rationale behind the chosen research methodology. The third part deals with the research design and details adopted steps, methods and procedures as well as strategies for evaluating the findings. The final section looks into ethical issues considered in the research.

3.1 Research Problem Summary

As stated in Chapters 0 and 2, to meet the challenge of designing processes that are useful in achieving business objectives and are accepted by the subjects, this study focused on enabling conditions and opportunities to act within a business process, as explained by the Theory of Affordances (Gibson 1979). Activity Theory (Engeström 2000), emphasising the relationships between an individual, the socio-organisational context, and the work activity system was also employed to investigate business processes (Marken 2006). The overarching research question leading the study was therefore:

*How can business process design be extended to consider affordances so as to enhance participants’ perception of action opportunities during process enactment?*
To answer the research questions the study addressed the following more specific research objectives:

**Objective O1:** Formulate an initial framework of business process affordances as viewed in the context of human activity within a work environment.

**Objective O2:** Investigate the experiences of various stakeholders regarding the processes that facilitate or hinder process enactment.

**Objective O3:** Identify how, in the view of relevant process stakeholders, the emergence of action opportunities during the enactment could be facilitated through the process design.

**Objective O4:** Synthesise the collected insights in an improved framework for understanding business process affordances and their utility in process design and enactment.

**Objective O5:** Evaluate the improved framework for understanding business process affordances and its application in process design.

### 3.2 Research Approach

The current section outlines the use of interpretive, exploratory/inductive and qualitative research approaches to justify the choice of the hermeneutic phenomenology as a research methodology throughout this study.

#### 3.2.1 Constructivism and Interpretivism

The study looked into the affordances emerging between the business processes and the process subject. Human actions within a business process are interwoven within the socio-organisational fabric of a business environment. Business processes are enacted within organisations consisting of people who bring their histories,
experiences and moods to interactions occurring within the process (Olson & Carlisle 2001). Our knowledge of business reality is a social construction based on interpretations of the world, where interaction with others, and historical and cultural norms influence the development of subjective views of business process experiences (Creswell 2007). We construct our experiences and our worlds, and the configurations of meaning and institutional life inform and shape our reality-constituting activity (Gubrium & Holstein 2000). This social construction view of reality as advocated by constructivist philosophy leads naturally to an interpretivist investigation. An interpretivist study of process enactment allows the contextualised meaning of this socially based phenomena to be understood (Butler & Fitzgerald 1997). Interpretivism is related to the epistemological stance of constructionism, according to which we are introduced to the meanings by engaging in the world around us.

Process enactment involves physical resources, artefacts and people, often organised into teams and collaborating with each other. Cooperative work is not only determined by the physical instruments such as equipment or information systems, but requires active construction by the participants of a common space where the meanings of the shared objects are debated, resolved, interpreted and assigned by specific actors on specific occasions of use (Bannon & Bødker 1997). The world “is a domain of possibilities and (...) individuals participate in the realization of some of [them]” (Heft 2003, p.169). Actors’ goals and objectives help them to formulate and realise the opportunities presented to them in the course of their everyday existence (Butler & Fitzgerald 1997). Business process enactment can therefore be seen as a dynamic structure with opportunities for action offered to the subjects. The specific choice of behaviour or action will depend on the subjective meanings developed by the process participant. For example, a specific technology used in the business process can be interpreted in different ways by different people, some viewing it as empowering while others as deskilling (Barley 1986; Doherty & Doig 2003). The same human action can have different meanings for different people and the role of the researcher is to interpret this empirical reality for what it means to the observed people (Lee 1994), “to piece together people’s words, observations, and documents
into a coherent picture expressed through the voices of the participants” (Trauth & Jessup 2000).

Perception plays an important role in human understanding of the world as well as engagement with the world (Merleau-Ponty 1962); it is the primary source of knowledge (Moustakas 1994). Humans do not react to external factors, instead they respond to their own perception of what these factors mean (Jones 1975). The perception of a business process is therefore dependent on the process subjects. Accordingly, subjects’ engagement in the process enactment, whether with material or conceptual instruments used in the process or with other individuals participating in the process, will be driven by their perceptions. The rich context and complex relationships arising within the business process enactment and emergence of process affordances require looking into human views, opinions, thoughts, feelings, and judgements. Hence, the interpretive approach would be recommended to understand people and the social and cultural contexts within which they work.

As reality is not objective and independent but subjective and constructed by humans, process affordances will emerge in a particular business context and depend on the subjective views and opinions constructed by the participating individuals. Consequently, to understand human actions within a business process we need to reflect on the meanings developed by individuals during the process enactment and understand the way in which they create, modify and interpret the world in which they find themselves (Moreno 1999). Exploration of such meanings can enhance the design of the processes and will therefore be crucial in answering the research question.

Interpretive research assumes that “our knowledge of reality is gained only through social constructions such as language, consciousness, shared meanings, documents, tools, and other artifacts” (Klein & Myers 1999, p. 69). It is “aimed at producing understanding of the context” of the actors (Walsham 1993, p. 4) and focuses on the complexity of human sense making as the situation emerges (Kaplan & Maxwell 1994). Consequently interpretive research does not predefine dependent and independent variables. It contrasts with positivism, which advocates the existence of
an independent reality that can be objectively measured by the researchers and their instruments through formal propositions, quantifiable measures of variables, hypothesis testing, and the drawing of inferences about a phenomenon from the sample to a stated population (Orlikowski & Baroudi 1991). The social context of process enactment makes the interpretive approach more suitable to answer the research questions than the positivist one.

3.2.2 Exploratory Inductive Investigation

To answer the research questions we needed to look into action opportunities offered by business processes to the subjects. As there were no known prior attempts to apply the affordance concept to business processes and no current understanding of the phenomena, an exploratory study was undertaken. Such an approach is used when researchers’ insights are scarce or hard to confirm based on the evidence available (Sarantakos 1996) and it builds “rich descriptions of complex circumstances that are unexplored in the literature” (Marshall & Rossman 1999, p. 33). Exploration puts the researcher in a place where discovery is possible (Stebbins 2001).

While little work on business process affordances has been conducted to date, there was a considerable body of knowledge on action opportunities provided by physical objects in the environment. However, the majority of prior research on affordances is theoretical. While some empirical research exists, it is limited to simple actions, such as climbing stairs (Warren 1984), sitting (Mark et al. 1990), or grasping objects (Lopresti-Goodman, Turvey & Frank 2011). Attempts to investigate affordances relating to complex actions within a social context are very limited.

Insufficient prior understanding of business process affordances and affordances of complex actions warranted an exploratory study of the phenomena. An exploratory research approach sought to elicit practitioners’ experiences and the issues that concern them (Schutt 2011) in order to identify and discover important themes, patterns and categories of meaning and to explore how such patterns are linked with one another. Such an approach enabled the collection and analysis of business process enactment data, exploration of business practices and eventually a
framework for understanding both business process enactment and subjects’ experiences related to it.

Exploratory research is linked to the inductive process where general propositions emerge through consensus from specific examples investigated in interviews or the analysis of text (Creswell 2007). Reliance on rich personal accounts of perceptions, feelings, and judgements about what happens when the business process is enacted, provided qualitative data, the meaning of which was deconstructed effectively through the inductive process of theory building. This was achieved by organising the data into abstract units of information and analysing it to identify themes and categories that fit into a proposed framework. Induction is a self-corrective and devoted effort to build a comprehensive system (Tursman 1987) by following the empirical data wherever they may lead (Graziano & Raulin 2000). Identification of emergent meanings, as perceived by study participants, helped to reveal the essence of business process enactment, and through that, process affordances. New insights were discovered and thematic structures developed from the bottom up as we moved from specific instances to broader generalisations and theories by detecting patterns and regularities (Hoepfl 1997). Since there was no known prior research on business process affordances the use of an inductive inquiry was important.

While the current study used a primarily inductive process, as with most social research it also involved deductive processes at some time (Richards 1993). Induction and deduction are linked research approaches (Miles & Huberman 1994) as the process of ongoing theory advancement requires continuous interplay between the two (Parkhe 1993). In the current study the existing Theory of Affordances and Activity Theory had an important function in the design of a research project, and this itself introduced the element of deduction.

3.2.3 Qualitative Research

It is quite common for exploratory research to adopt qualitative research methods (Neuman & Kreuger 2000). Once the overall research question was identified, the choice of a qualitative approach was logical as this question required the exploration
of business process affordances not yet covered in theory. Reliance on rich personal accounts of perceptions, feelings, and judgements about what happens when the business processes are enacted, provided rich data, with the potential for revealing the true complexity of the phenomena investigated. An explanation of how and why events happened was provided by collecting qualitative data related to participants’ experiences over a period of time. Some such experiences included adjustments or redesign of processes and facilitated comparison of affordances before and after the change.

As reality is constructed by the individuals from their personal perspectives, their lived experiences may not be what we expect and we had to look for such revelations. A qualitative approach to research was uniquely suited to uncovering the unpredicted and exploring new avenues, as it is very flexible and enables the researcher to follow new leads based on emerging insights and discoveries (Miles & Huberman 1984). Qualitative data was able to capture people’s lived experiences and was suitable for identifying the meanings that people attached to the structures, processes and events of the social world they live in.

The current study looked into how business processes are enacted to gain an understanding of action opportunities offered to the process subjects. As process affordances have not been properly studied in the past they need to be investigated via practitioners’ rich, personal, tacit and unstructured experiences. The behaviour, needs, and thoughts of the individual can be better comprehended if the investigator conducts an in-depth study into their world and their roles in that world (Cronbach 1975). This includes perceptions and opinions of process subjects which are difficult to investigate with surveys and questionnaires (Walsham 2006) since much meaning is lost when data are quantified (Kaplan & Maxwell 1994). Since the aim of this study was to understand process enactment from the participants’ point of view and to understand the particular social and institutional context in which enactment occurs, qualitative data was collected. This data was in the form of text, as notes and transcripts.
3.2.4  Hermeneutic Phenomenology as a Method of Inquiry

The concept of affordance is relational, meaning it depends not only on the properties of the environment but also on the properties of the actor and specifically on his perceptions of the environment around him. The notion of affordance has therefore phenomenological and perceiver relative qualities (Heft 2003). Exploration of meanings constructed by the relevant stakeholder was crucial in answering the research question. The main focus of the study was therefore on the subjective views, perceptions, opinions, thoughts, feelings and judgements of the process participants and designers. As reality is contingent upon human practices, such meanings depended on consciousness and experience. Consequently, the structure of the phenomena could only be understood by studying the experiences of the participating individuals (Husserl 1970a). In other words, we looked into how people experience their life world rather than an externally and arbitrarily defined fact-world. Consequently, the phenomenological approach was an eminently suitable choice (Husserl 1965) since it investigates the structures of subjective experience and consciousness by exploring how people are-in-the world as opposed to a dualistic separation from it (Rennie 2000).

**Phenomenology** breaks with a positivist cause-and-effect analysis and is not aimed at establishing facts, defining truth and offering proof beyond doubt. There are no variables defined in the study and no assertion of the existence of absolute knowledge. Phenomenology is the study of the phenomenon and concentrates neither on the *subject* nor on the *object* of experience. It is the practical understanding of meanings and actions that is at the core of phenomenological research (Cole 2002). The focus is on the point of contact at which “being and consciousness” meet (Sanders 1982). This point includes every mental act such as perception, emotion, remembering, feeling, desiring, willing, or fantasising. Exploring human experience by understanding and classifying conscious acts and mental practices and investigating essential laws that such acts are subject to, contributes to knowledge and knowing (Moustakas 1994).
Affordances are a direct and unmediated experience during which our awareness drops to a minimum and our encounter with the world is almost automatic. Consequently, affordances are well married with phenomenology. Perceiving the affordances of our environment means “we are immersed in situated (...) doing and being” (Heft 2003, p. 151) and only such immersion allows us to experience affordances. In other words they are difficult to notice from a stance of detachment so typical to positivist approaches (Heft 2003, p. 152).

Phenomenology puts an emphasis on the world as lived by a person as opposed to a world that is separate from an individual. Understanding or comprehending meanings of human experience is achieved by systematic reflection on the phenomena as it is lived (Polkinghorne 1983). The life world is understood as what we experience pre-reflectively, without resorting to categorisation or conceptualisation (Husserl 1970b). Our lived experience is composed of the everyday world in which we live and appears in our acts of consciousness. It may be viewed as a dialogue between a person and the world (Valle, King & Halling 1989).

The goal of phenomenology is not to prove beyond doubt that something is universally true and exists in the same way for everyone, but to unravel the complex experiences that constitute the fabric of life. Focus shifts solely to things as they appear to us rather than as they objectively are. The physical properties of the business process environment may be identical but they may be perceived quite differently because each subject imposes his or her own interpretations, judgement and evaluation on such an environment. This is captured by Frankl when he says: "between stimulus and response there is a space. In that space is our power to choose our response" (Frankl 1961, p. 122). In other words, humans do not see reality but they interpret what they see and call it reality (Rao 2010).

There are many schools of phenomenology, and even though they all have some commonalities, they also have distinct features (Dowling 2007). Purely descriptive transcendental phenomenology is aimed at describing the objective reality of the nature of the phenomenon (Caelli 2000), in our case this would be process enactment. Interpretive phenomenology chosen for the current study goes beyond
pure description and aims at understanding the reality of the individual’s experience as they enact business processes. It is not description but understanding of the phenomenon that is sought after (Racher 2003). As every form of human awareness is interpretive (Heidegger 1962) the world must be interpreted by us in order for our intentional action to be possible (Boland 1985). Consequently, phenomenology interested in our immediate experience has hermeneutic roots (van Manen 2011). In other words, “phenomenology without hermeneutics can become shallow” (Todres & Wheeler 2001).

The term hermeneutics, meaning interpreting, originates from Hermes, the Olympian god of Greek mythology who was tasked with delivering messages from the gods to people. In order to articulate such divine communications he had to interpret them himself (Crotty 1998). The tradition of hermeneutics began as a legal and theological methodology governing the application of civil law, canon law, and the interpretation of Scripture. In time it became the theory of the interpretation of text that is difficult to understand (Rennie 2000). In the 19th century, the application of hermeneutics was extended to social realms with emphasis on historical and social contexts as important sources for understanding the author’s intended meaning and experiences (Heidegger 1962). As ideas are nested in historical and cultural horizons of meaning, a phenomenon can only be genuinely understood through a grasp of its origin (Gadamer 1998). The collected narratives are coded to simplify the textural representation of meaning. If required an existing theoretical lens is adopted (Fridey, Cybulski & Nguyen 2010), in our case Theory of Affordances and Activity Theory. Reflecting on the distance that may exist between the investigator and the author of the text (interviewed participant) we are able to develop potentially hidden meanings conveyed by research participants. Fusion of understandings as new narratives become available enables us to move beyond what a text says and allows us to interpret what it talks about (Ricoeur 1975).

The focus shifts to in-depth understanding of the collected narratives through coding and simplifying the textural representation of meaning, reflecting on the distance that may exist between the investigator and the author of the text (interviewed participant), development of potentially hidden meanings conveyed by research
participants, fusion of understandings as new narratives become available, and adoption of an existing theoretical lens if required (Fridey, Cybulski & Nguyen 2010). Interpretation of a text moves beyond what it says to what it talks about (Ricoeur 1975).

The current study adopted hermeneutic phenomenology (Moustakas 1994; van Manen 1998) as a research methodology, which accepts a phenomenological focus on human lived experience but rejects the view of the importance of description rather than understanding (Racher 2003). The lived experience was explored utilising hermeneutics, founded on the ontological view that every experience is an interpretive process (Racher & Robinson 2003). We cannot understand the way we “know the world” but the way we “are in the world” (Heidegger 1962). Humans are raised living within a particular time, culture and family, all of which precede the development of the individual; therefore, their consciousness is not separate from the world, but remains a formation of the historically lived experience (Laverty 2003). Business process subjects are not Cartesian subjects holding objective or subjective views, they are “beings-in-the-world”, already situated and committed. They are not autonomous, self-sufficient actors with disinterested intentionality, they are busily engaged in-the-world, always involved and concerned with practices (Introna 1997).

Phenomenological hermeneutics (Heidegger 1962) emphasise the socio-historical context for the subject in focus. Our lives are contextualised and our background, history and culture affect how we perceive the world, experience it, understand it, and determine what is ‘real’. Individuals approach the life world with knowledge composed of social constructs and categories which are applied to aspects of experience, thus making them meaningful and familiar (Schutz 1964). The understanding of who we are is therefore not cognitive but lived (Chesla 1995; Laverty 2003). When applied to personal views, opinions and reminiscences, hermeneutic interpretation complements phenomenological investigation by providing insights into human lived experience in its rich sociocultural context (Ricoeur 1991). Humans cannot extract themselves from the world, and their realities and perceptions are invariably influenced by the world in which they live (Lopez & Willis 2004). Consequently, the engagement in the real world influences how
individuals perform business processes and what process affordances emerge during the process enactment.

A study of the structure that governs instances or particular manifestations of business process enactment revealed the essence of process affordances (van Manen 1998). Personal knowledge and subjectivity was important as it provided insights into people’s motivations and actions (Lester 1999). Hermeneutic phenomenology provided an analytical framework to assist interpretation and understanding of text (or its analogue) by helping me to become immersed in the narrative and capture the underlying meaning by reconstructing the inner world of the subject’s experience.

Understanding the phenomenon was achieved through the **hermeneutic circle**, represented by the circular movement of thought from the studied text to the contexts of the author and back to the text (Dilthey 1976), in other words “iterating between considering the interdependent meaning of parts and the whole that they form” (Klein & Myers 1999, p.72). This approach allowed to “correct our prejudices or set them aside and hear what the text says to us” (Gadamer 1976b, p. xviii).

A hermeneutic process consisted of many different cycles within a whole circle. The researcher’s understanding at a specific point in time influenced the next cycle, the questions asked and the insights acquired. This understanding was a product of biases resulting from the researcher’s experience, and this includes reviewed literature and any theoretical lens adopted. In turn, whatever was gained from the cycle affects the researcher’s understanding. Under such a method shared meanings emerged (Chesla 1995) and individuals participating in the research actively contributed to the understanding (the principle of interaction between the researcher and the subjects (Klein & Myers 1999). In other words, when we studied a person, we did not look at them but with them in a dialogue searching for understanding (Gadamer 1976b). To emphasise the influence of research subjects I decided to use the term co-researcher throughout the thesis rather than the research participant.
Understanding between the researcher and the co-researchers developed through a lived relationship, which fuses the lived experience and allows shared meaning to develop (Standing 2009). While the research was faithful to the horizons of the co-researchers, it also included the researcher’s own comprehension and interpretative insight (Sharkey 2001). As the relationship with co-researchers shapes the research process and outcomes, a high level of researcher’s engagement was required for the study to be deemed rigorous (Chesla 1995). Hermeneutic phenomenology therefore emphasises the importance of the inquirer. Being-in-the-world applies as much to the co-researchers as to the researcher. It is natural for the investigator to have prejudices from past social and cultural experiences and it is impossible to simply remove such preconceptions. A researcher’s past experiences contribute to the person they are. Prejudice or prior knowledge is simply the initial point in the research, it strongly motivates and drives the researcher’s understanding of the studied phenomena (Klein & Myers 1999).

The research question sought understanding of business process enactment and specifically what facilitates or constrains the actions of the process subjects. It was impossible to accurately discuss human actions without considering the meaning of such actions, and also the relationship between what humans think and what they experience (Hein & Austin 2001). Process subjects’ and designers’ narratives, which were at the core of hermeneutic phenomenology, impacted our understanding of their engagement in the process enactment, their lived experience of it. Such an approach was an appropriate method to capture the dynamic structure of business process affordances, which emerged in a particular business context, and was driven not only by the physical environment but also by subjective human motivations, emotions and social interactions. The inherent complexity of human actions and subjectivity in the perception of action opportunities made hermeneutic phenomenology a suitable choice for the research.

Hermeneutic phenomenology does not share positivist science’s interest in how things work and does not look for a theory identifying variables and their causal relations to make predictions. Phenomenology is concerned with what things are through a methodical process of description of that which is immediately presented.
to consciousness (Boland 1985). This approach is not aimed at uncovering causal laws but the practical understanding of meanings and actions (Cole 2002). There was therefore no variables defined in the study and no assertion of the existence of an absolute truth.

Numerous authors have adopted hermeneutic phenomenology in information systems research (see for example Boland 1991; Fridey, Cybulski & Nguyen 2010; Klein & Rowe 2008; Mentz, Kotzé & van der Merwe 2012) and in the exploration of different aspects of business processes (see for example Crampton 2012; D'Cruz & Noronha 2008; De Gagne & Walters 2010; Johnson 2012; Mentz, Kotzé & van der Merwe 2012). An influential work on the evaluation of interpretive research in IS derives the relevant principles to a large extent from phenomenology and hermeneutics (Klein & Myers 1999). Some academics promote hermeneutics as a valuable, albeit challenging tool for IS research (Webb & Pollard 2006). There are also those who argue that phenomenology should be a preferred research method because the organisations in our life world are constituted by acts of communication and are fundamentally an interpretative problem (Gadamer 1976b). Since phenomenology aims to communicate the “structures of meaning embedded in lived experience” (van Manen 1998, p. 11), it offers a way of developing a deeper understanding of process enactment, making it an ideal approach to capture and refine rich and expressive experiences that are highly subjective, dynamic and largely interpretive (Denzin & Lincoln 2011).

### 3.2.5 Alternatives to Hermeneutic Phenomenology

While hermeneutic phenomenology presented itself as an eminently suitable choice, other methodological approaches were also considered. The following section presents the main characteristics of those alternative approaches and illustrates the reasons why in the end they were rejected.
3.2.5.1 Grounded Theory

Grounded theory methodology allows the researcher to inductively develop a theoretical account of a topic while simultaneously grounding the account in empirical observations or data to create a “unified theoretical explanation” for a process or an action (Corbin & Strauss 2008, p. 107). The method begins with the collection of data through a variety of instruments and continues with coding the key points that are grouped into similar concepts, which in turn form categories on which the creation of a theory is based (Glaser & Strauss 1967).

The intent of a grounded theory approach is to move beyond description and generate or discover a theory (Corbin & Strauss 2008). While this was essentially incorporated in the objectives of the current study, grounded theory research is not intended to deeply explore the genuine views and feelings of respondents (Wimpenny & Gass 2000). Additionally, according to some sources, the focus of grounded theorists on every piece of data may become more important than the contextual relevance of such data (Charmaz 1990). As the current research explores business process affordances, which can be subjective and dependent on people’s judgement, motivations and emotions, a deeper understanding was required than the one that could be provided by grounded theory.

3.2.5.2 Ethnographic Study

Ethnography is aimed at exploring cultural phenomena and reflects the knowledge and the system of meanings in the lives of a cultural group. In other words it focuses on an entire culture-sharing group. It is not so much a study of culture as a study of the social behaviours of an identifiable group of people (Wolcott 1999). The researcher looks for patterns in the group’s ideas and beliefs, expressed through language or activities (Fetterman 2010). The analysis of an ethnographic study results in an understanding of how the culture-sharing group works and functions (Wolcott 2010).
While ethnographic investigation looks into deep meanings developed by people, it typically studies individuals who interact over time (Creswell 2007). The current study intended to examine many individuals who share similar processes, actions or interactions but who were not located in the same place or interacted on a basis frequent enough to develop shared patterns of behaviour. Consequently an ethnographic study did not present a viable methodology for the project.

### 3.2.5.3 Case Study

The case study research method is “an empirical inquiry that investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used” (Yin 1984, p. 23). Such an approach may present itself as a valid choice to explore business process enactment and emerging process affordances. The case study methodology however focuses on exploring a “bounded system (a case) or multiple bounded systems (cases) over time through detailed, in-depth data collection involving multiple sources of information” (Creswell 2007, p. 97). The analysis can relate to persons, events, decisions, periods, projects, policies, institutions, or other systems that are studied holistically by one or more methods (Thomas 2011).

A case study being “an intensive analysis of an individual unit” (Denzin & Lincoln 2011, pp. 301-316) could provide a snapshot of process enactment but it is not designed to explore in-depth lived experience which is part of the current research objectives (see O2 in section 3.1). While the case study, the most common qualitative method used in information systems research (Orlikowski & Baroudi 1991), could be suitable to develop descriptive insights into business process enactment, it is not intended to explore lived experience. Such experience is especially important in the context of affordances that have unreflective qualities which make them sources of knowledge (Heft 2003) and require insights into participants’ subjective perceptions and motivations. Consequently, a case study option presented itself as too restricted and less relevant than a phenomenological investigation. Exploration of lived
experience offered a better way to look into human actions within a business process and such experience could not be bound in a system that can be looked at using a case study approach.

Table 3.1 presents specific characteristics of the investigated phenomenon of business process enactment and the research approach addressing such characteristics.

Table 3.1: Characteristics of the phenomenon investigated in the current study.

<table>
<thead>
<tr>
<th>CHARACTERISTICS</th>
<th>RESEARCH APPROACH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social context</td>
<td>Interpretivism</td>
</tr>
<tr>
<td>No current understanding of phenomena/Theory building from data</td>
<td>Exploratory study / Inductive process</td>
</tr>
<tr>
<td>Reliance on rich personal accounts of what happens</td>
<td>Qualitative data</td>
</tr>
<tr>
<td>Focus on subjective views, opinions and lived experience</td>
<td>Hermeneutic phenomenology</td>
</tr>
<tr>
<td>Fusing multiple insights, gradual refinement of understanding</td>
<td></td>
</tr>
</tbody>
</table>

The current section looked into the characteristics of the investigated phenomenon and specific approaches appropriate to address such features, and discussed the foundation of the study process. Following the framework proposed by Crotty (Crotty 1998), four elements of the research described in section 3.2 above are presented in Figure 3.1.

3.3 Research Design

The research was conducted in a number of stages, starting with a literature review and a pilot study to gain preliminary understanding of the investigated phenomena.
This was followed by a number of interviewing cycles where understanding of the collected data was built up using hermeneutical phenomenological analysis, leading (eventually) to the model of business process affordances. The undertaken activities were in line with the phenomenological method and corresponded to the cyclical stages of hermeneutical interpretation (Moustakas 1994). They also assisted in meeting the research objectives detailed earlier. Understanding the full nature of business process affordances occurred through the reflective process of: analysis, making observations, and analysis again to refine the insights gained from the data.

The research relied on the iterative process of going through preliminary reflection, data collection, analysis, conceptualisation and evaluation by following the hermeneutical phenomenological process as presented in Figure 3.2.

The literature review stage (see 1st cycle in Figure 3.2) was followed by a pilot study (see 2nd cycle in Figure 3.2). The pilot study (discussed in chapter 4) looked into a small range of experiences in process enactment in a workplace where business processes were redesigned. The objective of the pilot study analysis was to determine if process subjects’ actions were facilitated or constrained through the business process changes. Subsequently, interviews (discussed in chapters 5 and 6) focussing on the lived experience of stakeholders involved in various aspects of process enactment were conducted (see 3rd cycle in Figure 3.2). 16 interviews took place (for the list of co-researchers and their characteristics see section 5.1) which corresponded to the suggestion of approximately 15 interviews for a phenomenological inquiry (Moustakas 1994). The exact number of interviews was established when the saturation point on issues relevant to the research question was reached and no new insights were being gained. Finally, a small number of evaluation interviews (discussed in chapter 8) was also conducted with independent practitioners (process designers) to discuss the findings and evaluate the proposed framework (see 4th cycle in Figure 3.2). The list of four co-researchers participating in evaluation interviews and their characteristics can be found in section 8.1.
Figure 3.2: Research design of the study.
The details of specific methodological steps, research methods, procedures and techniques employed in the investigation and corresponding to the research objectives (O1 to O5) are described in the following sections.

### 3.3.1 Data Collection

As outlined above, data will be collected through a pilot study and a series of interviews.

#### 3.3.1.1 Pilot Study

A pilot study is a small scale preliminary study conducted to evaluate feasibility and improve upon the study design prior to performance of a full-scale research project (Hulley et al. 2006). It is usually carried out on members of the relevant population, in our case people who enact or design business processes.

The pilot study reported in this thesis centered on a payroll process in an Australian corporate group where I was involved as an external consultant. Firstly, being involved in this process redesign project I was aware of significant benefits that process design changes brought to different process stakeholders. Secondly, the payroll process involved multiple stakeholders (all employees and managers) working in nation-wide organisation. Payroll was performed in multiple locations which required collaboration between different process participants. For this reason, the process was likely to involve not only functional but also social aspects of the process enactment. Another advantage of the chosen process was that as a party involved in the redesign project I was in possession of secondary data in the form of emails, reports and meeting agendas. Finally, the organisation’s management indicated that they agreed to be the subject of the research provided this did not disrupt their daily business routine.
### 3.3.1.2 Interviews

As explained in section 2.4, human actions within a business process are largely determined by the sociocultural context in which they occur. Since the literature on human aspects of process enactment is scarce (Vergidis, Turner & Tiwari 2008); (Cunha, Antunes & Barata 2014), the best approach to gain the required knowledge was to study the experiences of individuals capable of informing this research. Such individuals involved those who perform actions (process subjects) or who design business processes that drive such actions (process designers). A series of interviews was conducted to find out what enables and constraints human actions within a process. Co-researchers actively participated in the research by discussing their recollections and opinions so that their own perspective on business processes enactment emerged. This allowed exploration of issues such as: the ways in which people working together share common understandings; the informal procedures employed in the business processes; and the motives behind decisions and actions.

One of the main advantages of interviews includes the ability to find out things that cannot be directly observed, such as what is on people’s minds and how they experience the environment around them (Patton 1990). Another benefit of interviews is the ability to capture unexpected results, as complex questions could be explored and new directions of inquiry can be followed as a result of what the interviewees say. Through personal interaction, the researcher has a high level of control and can follow-up on incomplete or vague responses (Peng et al. 2010; Welman & Kruger 2001).

While the advantages of interviews are well established, the limitations of this data collection method must also be considered. One of the common critique points relates to the verbal claims of interviewees differing from their actual behaviour. In the business context, however, it is not only important what people do but also what they say they do or what they think they do (Hannabuss 1996, p. 22). Another limitation of interviews may be the researcher’s bias or misinterpretation of responses. These drawbacks were addressed by strict adherence to the principles of the hermeneutic phenomenological method as suggested by Moustakas (see section
3.3.2.2). The final drawback of the interview technique relates to it being costly and time consuming for the researcher, which in effect limits the number of interviews being undertaken. The final number of interviews was determined by the achievement of theoretical saturation, a point in data collection and analysis where no new ideas arise (Aken 2004).

Semi-structured interviews were used where open-ended questions were asked to get at what co-researchers really experienced (Geertz 1973). The emphasis was placed on co-researchers’ own words in order to respect their meaning and encourage emerging narratives. Additionally, to minimise disconnectedness from the substance of experience, what and how instead of why questions were encouraged (Hollway & Jefferson 2000). Sample questions are listed below:

- What are your experiences when using information systems during your work?
- How did you learn how to do what you do?
- What did you change to make your work easier?
- What are your experiences of collaboration between people who are involved in the business processes you participate in?
- What is your experience with people bypassing the processes?

All interviews were recorded and transcribed. As I looked for understanding experiences from co-researchers’ points of view, the interviews took the form of conversations between equals, where neither interviewer nor interviewee assumed the position of expert (Moreno 2002). It is important to note however that in the qualitative interview binding rules of method are not really important as human discourse is complex and varied. The interview is seen as an art rather than a science where personal sensitivity and creativity cannot be formalised. The aim of the interview was not to produce objective data but rather to understand where people use their own words in describing their own experiences (Miles & Huberman 1984).
3.3.1.2.1 Sampling and Recruitment of Co-researchers

The goal of the sampling process of qualitative research is sound selection that allows the researcher to study the problem under examination (Glaser & Strauss 1967). In hermeneutic phenomenological research the main criterion for the selection of co-researchers is their having experienced the phenomenon of interest. The study employed therefore internal experts, such as process participants or managers, and external experts, such as process design consultants, who engage in business processes and develop first-hand experience of both the benefits of well-designed processes and the difficulties that arise when processes are not a good fit for the particular context in which they are used.

The investigation adopted a purposeful sampling approach called **heterogeneity sampling** for selecting co-researchers. Purposeful sampling is often used in exploratory research, where selected individuals can “purposefully inform an understanding of the research problem and central phenomenon in the study” (Creswell 2007, p. 126). Heterogeneity sampling seeks to capture the themes that emerge out of variation (Patton 2002), allowing the researcher to identify that which is constant from that which varies in the different situations (van Kaam 1959).

Prospective co-researchers were identified in multiple ways and approached face to face. Some contacts were obtained through an ERP consultancy company to locate businesses with recent experiences of information systems implementations and likely business process changes. Other contacts were approached among professional and business people in my acquaintance who I believed might be suitable co-researchers. The remaining participants were searched for among contacts recommended by people known to me from academia and social interactions. Details of all co-researchers business context and personal characteristics are presented in sections 5.1 and 8.1.
3.3.2 Data Analysis

Data analysis procedures encompasses the process of inspecting, cleaning, transforming, and modelling data with the goal of highlighting useful information and suggesting conclusions. In the context of this data analysis, the hermeneutic investigation included a pilot study and phenomenological investigation of business process enactment.

3.3.2.1 Pilot Study

In the pilot study, a reflective analysis of the payroll process redesign in an Australian corporate group of 10 companies was conducted to look for the affordances offered to the process subjects. The analysis allowed exploration of a business process redesign project, and specifically situations, reasons and consequences for the process enactment (Schön 1983). Two important characteristics of the project assisted in the current investigation. Firstly, the payroll process was analysed holistically, with detail and richness which could not be gained from the subjects involved only in the specific process tasks. Secondly, a redesign aspect presented the evolvement of the process over time, which allowed comparison of affordances before and after the business process change.

Reflective analysis of the pilot study considered the payroll process as an activity system. It looked into the different elements of such a system (process subject, objective, stakeholders, inputs, rules and the division of effort) and explored how changes to those elements affected different categories of affordances offered to the process subjects. Details of the analysis are presented in Chapter 4.

3.3.2.2 Interviews

As the objective of interviews was to gain insights into people’s experience, views and opinions data analysis within each cycle of interviews adhered to the phenomenological method proposed by van Kaam and modified by Moustakas
Van Kaam’s method dictates that the research investigator and participants are considered in equal measure as contributors to the findings and are therefore referred to as co-researchers, as explained in section 3.2.4. By capturing and analysing this project co-researchers’ lived experiences, the reported views, opinions and accounts of their work assisted in the development of my understanding of business process enactment and affordances.

Interview transcripts were analysed following the principles of hermeneutical investigation. This approach involved the circular movements of thought from the studied text to the contexts of the authors and back to the text. The iterative cycle of observation–description which was performed at different stages of analysis added new perspectives to the study and facilitated interpretation and understanding of process affordances. By approaching business process enactment from different viewpoints, new perceptions formed to alter what has previously been understood and a new horizon of understanding arose. Each new event was interpreted in light of the insights gained from previous events, and so my personal understanding fused with insights coming from other participants. Such an approach allowed me to reconstruct the meaning and derive the essence of the business process enactment experiences of co-researchers in a rigorous and transparent way. This in turn can help other researchers to follow the same path.

The specific processes of the adopted model, presented in Figure 3.2 include: Epoché, Phenomenological Reduction, Imaginative Variation, and Synthesis.

**3.3.2.2.1 Epoché**

The term epoché, referring to the theoretical moment when all judgements about the existence of the external world are suspended, originated in ancient Greece and was incorporated into the phenomenological method of research at the beginning of the 20th century. The process places all knowledge into question (Husserl 1931), forcing the researcher to “expose his or her biases in order to enter into the individual’s life world and use the self as an experiencing interpreter” (Moustakas 1994, p. 85). Potential biases are limited by developing statements of personal
prejudices and self-reflection relating to them at various phases of the research, such as before the data collection, and later, in the data analysis stage. Writing down biases is considered an effective method for avoiding presuppositions as it identifies the issues and brings them to our attention. Our consciousness is as receptive to reflections on the preconceptions as it is to unbiased looking and seeing, consequently the work involved in self-dialog reduces the influence of prejudgements.

By becoming aware of our prejudices and making them explicit before the interviews (Cole 2002), we can engage in the discussion being aware of our preconceived notions about what will be found in the investigation. In other words, our competency in setting aside theories, presuppositions, and ready-made interpretations in order to reveal the engaged, lived experience of the participants rather than their own is increased (Creswell 2007; Husserl 1931; Valle 1998). Without internal reflection and recognition of one’s pre-understanding, there is a risk that one will fail to understand or will misjudge meaning (Fleming, Gaidys & Robb 2003).

While eliminating our own biases completely is unattainable (Gadamer 1998), epoché is still useful as it has a “power to unveil facets of a phenomenon that would be overlooked if a restrictive, preconceived framework were used to look into it” (Moreno 2002, p. 1764). In other words:

“The suspension of our prejudices is necessary if we are to begin to understand text or text-analogue. (...) This does not mean that we simply set aside our prejudices. Rather, it means that we, as researchers, must become aware of our own historicity” (Gadamer 1976a, p.125).

3.3.2.2.2 Phenomenological Reduction

The main goal of phenomenological reduction is to obtain a rich and complete textural description of the lived experiences of participants (Moreno 2002). The term literally means reducing the natural world to a world of pure phenomena (Valle, King
& Halling 1989, p. 11). The main idea is “to hold subjective perspectives and theoretical constructs in abeyance and facilitate the essence of the phenomena to emerge” (Dowling 2007, p. 132).

The process of phenomenological reduction included listing and preliminary grouping of codes; reduction and elimination; clustering and thematising; and construction of individual and composite textural descriptions of the phenomena (Moustakas 1994). Reflective and iterative steps undertaken during this stage of the research corresponded to the principle of hermeneutical investigation when we refer to the text multiple times, each time increasing our insights and adding to our understanding (see section 3.2.4).

3.3.2.2.2.1 Listing and Preliminary Grouping

During listing and preliminary grouping, coding, involving recognition of data categories, was conducted to facilitate working with large quantities of data and allow the discovery of recurrent topics (Bogdan & Taylor 1975). Open coding was used to conceptualise co-researchers’ statements line by line. These were compared as more data was coded, and merged into new concepts (Strauss & Corbin 1990). Firstly, preliminary codes reflecting interviewees’ own wording was created from phrases that directly related to the process enactment. New phenomena were considered in their own context through a rigorous process of bracketing. This process eliminates inquirers’ reliance on their own experience (Boland 1985) and the need to refer to objective reality (Husserl 1931), both of which would bias understanding. Each statement is treated as holding an equal value in terms of describing and getting to know the individuals within their lived world. This horizontalising avoids assumptions of hierarchy and facilitates describing the experience, with less prejudice, and greater subtlety (Bradfield 2007). The preliminary codes were subsequently reviewed and those with similar meanings amalgamated to arrive at common codes. The purpose of this step was to distinguish the basic topics that were discussed.
3.3.2.2.2 Reduction and Elimination

The purpose of reduction and elimination is to arrive at horizons of the experience. This horizon consists of “a range of vision that includes everything that can be seen from a (...) vantage point” (Gadamer 1998, p.302) of a particular co-researcher. This was achieved by reflecting on each transcript and eliminating the statements and corresponding common codes that did not contain a moment of experience that contributes to the understanding of process affordances. Vague, repetitive and overlapping statements were excluded, and a specific view or perspective on the business process enactment with the relevant elements of activity system and manifested process affordances emerged. Each co-researcher brought in their own horizon of understanding of the observed phenomena and the purpose of the study was to understand other people’s viewpoints and merge those viewpoints into a consistent whole.

3.3.2.2.3 Clustering and Thematising the Invariant Constituents

In this stage, horizons that stand out (common codes discussed by multiple co-researchers) were identified as invariant constituents of the experience and listed and clustered into common themes relating to the elements of activity system and emerging process affordances. The relevant statements were thematised around participants’ actions and perceptions of action opportunities, based on the commonalities present within and between narratives. Theme recognition and analysis of keywords in transcripts are widely used in qualitative data analysis (Kelle 1997; Miles & Huberman 1994) to capture the meaning and develop an exhaustive description of each individual participant’s experience in context.

3.3.2.2.4 Individual and Composite Textural Descriptions

In the final stage of phenomenological reduction the horizons and themes were organised into a coherent description. The grouped themes were used to articulate the aspects of the activity system and business process affordances that were relevant to participants. Describing the experience encouraged us to look again and discover layers of meaning through the interweaving of person, conscious experience
and phenomenon. The preparation of textural descriptions clarified what I saw and helped me recognise and identify relevant qualities (Moustakas 1994).

Integrating all individual textural descriptions and identified themes resulted in a composite textural description. The movement between looking from the perspective of specific co-researchers to viewing something as a whole corresponds to the principle of the ontological hermeneutic circle. Composite textural description encouraged us to look for similarities and differences between co-researchers’ experiences and paved the way for imaginative variation presented in the next section.

3.3.2.2.5 Summary

Phenomenological reduction focused on determining common codes and subsequently themes related to the activity system and emerging affordances in the co-researchers’ experiences, with the aim of arriving at horizons of experience. My understanding was increased by following the hermeneutic circle through the reflective and iterative process of working with the interview transcripts (see Figure 3.3).

![Figure 3.3: Hermeneutic circles in phenomenological reduction of the study.](image)
The next stage, imaginative variation, explored in more depth the emergence of affordances and aimed at discovering the possible relationships.

3.3.2.2.3 Imaginative Variation

The purpose of imaginative variation is to develop understanding of how the themes relate to each other and how they impact the researched phenomenon. A structural description of each co-researcher’s experience was integrated into the composite description by looking into common aspects of participants and their diverse experiences (Moreno 2002). All potentially valid interpretations of the evidence could be considered. Reflection, careful examination and explanation of different possibilities searched for what is essential (Moreno 2002) and discovered what “make(s) a phenomenon what it is and without which the phenomenon could not be what it is” (van Manen 1990, p. 107). While it was a purely imaginative exercise, any transformed expression needed to describe a process that was contained in the original expression (Polkinghorne 1989). For this reason any articulated suggestions and explanatory statements were related back to the co-researchers’ experiences (Moustakas 1994) so they could be publically verifiable. Some refer to this as the “phenomenological nod” (van Manen 1990, p. 27), a way of demonstrating that we can recognise it as an experience that we had or could have had.

Imaginative variation, summarised in Figure 3.4, focused on the emergence of business process action opportunities during the enactment to determine structural themes. Firstly, I looked into specific categories of affordances to identify essential elements of the AAF model (see Figure 2.9) in the emergence of those action opportunities. Subsequently I looked into the relationships between different affordance categories. Finally, I explored textural themes to determine the manifestation of different categories of affordances facilitated by such themes and the strength of the relevant links. My understanding was increased by following the hermeneutic circle through a reflective and iterative process of working with the interview transcripts as presented in Figure 3.4.
3.3.2.2.4 Synthesis

Synthesis intuitively and reflectively integrates the textural and structural descriptions created in previous stages to develop the meanings and essence of the experience. Synthesis shows how horizons of understanding were developed into the findings, that is, how smaller pieces of knowledge are being constantly reconciled with the whole, as a product of an ontological hermeneutic circle. Such a unified description communicates what is common or universal within a phenomenon, the condition or quality without which a thing would not be what it is (Husserl 1931).

In interpreting and endeavouring to understand the social phenomenon of process enactment the horizons seen from different angles were fused. The fusion of horizons is the culminating point of the act of understanding between the interpreter and interpreted (Gadamer 1998), and involved “an interpretive synthesis of (...) pre-understanding with ‘objective’ observations in order to make sense of the phenomenon” (Butler & Fitzgerald 1997). Synthesis represents the ‘final truth’, the essence of an investigated phenomenon at a particular time and place from the vantage point of an individual (Moustakas 1994).
3.3.3 Evaluation of the Study

The study has been structured within a constructivist–interpretive paradigm and was concerned with the meanings and personal experience of individuals. Reality was defined by the negotiation of “truths” through a series of subjective accounts, and the findings derived does not represent objective reality but the opinions, beliefs and perceptions of co-researchers (Crotty 1998). Consequently, the evaluation of interpretive research is not just about the data but it depends on the design of the research, the instruments used, and the analysis and interpretation employed. In this study evaluation was therefore based on credibility, confirmability, transferability and authenticity (Denzin & Lincoln 2011) and not generalisability referring to making predictions based on a quantitative data. It is however important to note that in a final stage, a small number of interviews evaluating the framework proposed in the course of this research was also conducted.

3.3.3.1 Credibility and Confirmability

Credibility relates to “our ability to know where the data in a given study comes from, how it was collected and how it was used” (Shank 2006, p. 114). It is described as a truth-formulating process between the researcher and the co-researchers to demonstrate that the inquiry was conducted in a way which ensures the accurate description of a subject.

Confirmability questions how the research findings are supported by the collected data and is concerned with critical examination by other inquirers. In a qualitative study, the researcher brings a unique perspective to the investigation. An external researcher can judge the extent to which the findings of a study are shaped by the co-researchers and not researcher bias, motivation or interest (Guba & Lincoln 1989). Confirmability seeks the establishment of consistent research practices by studying the data collected during the original inquiry and looking into the explicit and implicit logic used to assemble the interpretations into structurally coherent and corroborating wholes (Guba & Lincoln 1989). Interpretations and outcomes need to
be rooted in data and not simply created by the researcher’s imagination. In other words there has to be a smooth logical progression evidenced in the research report. To increase the likelihood that credible and confirmable findings and interpretations are produced, prolonged engagement and persistent analysis (Lincoln & Guba 1985) were employed. This allowed the real context of the phenomena to be explored (the principle of contextualisation (Klein & Myers 1999) and facilitated accurate interpretations of the co-researchers’ experiences. The interpretation was also assisted by applying the principle of suspicion related to looking into possible biases in the narratives, and the principle of multiple interpretations related to possible differences in interpretation among the participants (Klein & Myers 1999).

Additional strategies to increase research credibility and confirmability related to: adherence to the phenomenological process of epoché (see section 3.3.2.2.1) which aims at recognising and moderating biases; transcribing all research events, ensuring that the data is not dependent on the researcher’s memory and allowing direct quoting of co-researchers’ own words; validating transcripts (co-researchers were provided with the transcripts and allowed to comment on the categories and the interpretations made) (Erlandson et al. 1993); and finally involvement of external peers in discussions, findings, conclusions and analysis (Guba & Lincoln 1989) through submission of articles to conferences and journals. One such paper resulting from the research was accepted for presentation and publication at the ACIS 2012 conference and another is under a review for a journal publication.

Finally, to increase the credibility and confirmability of findings and interpretations, triangulation was incorporated in the study design (Lincoln & Guba 1985). This technique was used to support the researcher’s constructions by looking at business process enactment from different aspects of empirical reality (Denzin 1978). The current study used: data triangulation, relating to data sources such as business process designers and business process subjects; investigator triangulation, relating to different evaluators, such as researcher and co-researchers participating in interviews; and methodological triangulation, relating to methods, such as a pilot study and interviews (Ely et al. 1991). Applying different procedures and then triangulating or comparing the results to see if they converge, enhanced the
robustness of the results. Triangulation in this study was closely related to the hermeneutic approach, which constantly evaluates its findings throughout the reflective fusion of understanding (Lukaitis 2010) and is achieved by exploring the views of different co-researchers.

3.3.3.2 Transferability

Transferability is the process of checking the extent to which the study’s results can be applied in another context or with other participants and yield the same findings (Guba & Lincoln 1989). While the theory developed through qualitative research cannot be extended to some defined population, it can be extended to other cases (Maxwell 2005). Evaluation of how well the findings of one inquiry might hold in another context was done by looking at the quality of the research report (Rodwell & Byers 1997). The researcher did not provide confidence limits of the study, but instead offered as complete descriptions as possible in order to facilitate transferability judgements on the part of others. It is the reader who determines “when and how the claims might ‘transfer’ to their own situations” (Lindlof & Taylor 2002, p. 240). Transferability is therefore a process of checking the degree of similarity between contexts and, through that, the extent to which results can be applied to the new context. When the conditions overlap and match, transferability is indicated.

The richness of views existing in process enactment was captured by using heterogeneity sampling (see section 3.3.1.2.1), which ensured that co-researchers come from a broad-ranging selection of business organisations and business roles. By providing details about the organisations and the participants as well as events and the relevant issues, I helped the reader to better sense the meaning of the context. By adopting hermeneutic phenomenology, all findings were reported to the readers to interpret and understand so they could reflect on the applicability of these findings in relation to their own specific circumstances.
3.3.3.3 Authenticity

Authenticity addresses the critique of qualitative research that evaluation is based only on the theoretical assurance of validity at the expense of practical application (Whittemore, Chase & Mandle 2001) and involves reflecting on the meanings and experiences that are lived and perceived by the participants (Sandelowski 1986). This study selected hermeneutic phenomenology as a method of inquiry. The practical understanding of meanings and actions is at the core of phenomenological research (Cole 2002). Hermeneutic interpretation provides insights into human lived experience in its rich sociocultural context (Ricoeur 1991). Both approaches therefore enhanced research authenticity. In other words the chosen methodology presented an opportunity to impact members of the culture or community being researched, making the investigation worthwhile and authentic (James 2008).

3.3.3.4 Evaluation Interviews

The final evaluation of my investigation was conducted through interviews with co-researchers who have had experiences in process design. The proposed business process framework as well as practitioners’ heuristics were discussed to assess the utility of the findings and their application in business practice.

3.4 Anticipated Ethical Issues

To ensure that the study addressed the relevant ethical considerations and was conducted in accordance with the appropriate ethical guidelines, such as the Australian Code for Responsible Conduct of Research or the National Statement on Ethical Conduct in Human Research, ethics approval from Deakin University Business and Law Faculty HEAG was obtained on 6th August 2012.
3.4.1 Informed Consent

Prior to the data collection, every individual was presented with The Plain Language Statement and The Consent Form (attached in Appendix 1) clearly disclosing the purpose of the investigation and voluntary nature of participation. Pre-existing relationships between the researcher and some participants existed (e.g. ERP consultancy firm and business professionals employed by such firms in the implementation of information systems); however, the research focused on professionals, who were experts in their own right, and there were no unequal relationships. The researcher had no control over the co-researchers, nor did the co-researchers have influence over each other.

3.4.2 Privacy

Revealing the co-researchers’ or their organisations’ names may be considered unethical (Salkind 2006), therefore ethics approval was obtained for observations and interviews on the assumption that the privacy of the organisations and individuals involved is protected. Research instruments such as interviews that were used in the study make the respondents identifiable to the researcher. Good care was taken to ensure that data is re-identifiable only by the code. The identification keys for such codes were kept secure, with limited access by the researcher and two supervisors.

3.4.3 Participants’ Risk

To minimise the risk of harm, the research maintained co-researchers privacy (Shank 2006). This was important as disclosing negative information on business process enactment in the organisation could potentially have a detrimental effect for the individual. Additional risk could relate to the disruption of the organisations’ and individuals’ day-to-day activities during the data collection stage. To reduce such risk all interviews were conducted at the co-researchers’ convenience, using the time and place nominated by them. A final risk to be considered related to the nature of the
business processes. The interviews with the process participants and designers did not pursue information about the detailed solutions that have the potential to offer a competitive advantage in the marketplace, and only sought the personal views and generic experiences relating to the participation in business processes and enhancement or constraints of business actions offered by the process design.

3.4.4 Researcher’s Bias

The hermeneutic phenomenology adopted in the study accepts that it is natural for an individual to have prejudices from past experiences and it is impossible to simply remove such preconceptions, as they are the initial point in research and motivate the researcher’s understanding of the studied phenomena (Klein & Myers 1999). The researcher’s bias was however carefully addressed through incorporating a phenomenological process of epoché (section 3.3.2.2.1) with regular documentation of the inquirer’s developing construction (Guba & Lincoln 1989) to acknowledge, record and interpret one’s biases (Heidegger 1962).

3.5 Chapter Summary

The chapter determined hermeneutic phenomenology as the most appropriate method to answer the research question on stakeholders’ perceptions of affordances within the business processes and their opinions on how such affordances can be used to improve the alignment between process design and enactment. The chapter established a need for looking into subjective meanings that drive human actions within the business process and the advantage of the constructivist–interpretivist paradigm in this regard. Hermeneutic phenomenology was chosen for the current study as it can reveal the genuine views of respondents and explain why they do what they do. By concentrating on lived experience in its rich sociocultural context and subjective views and opinions, as well as providing techniques to deal with the researcher’s bias, the methodology can provide deep insights into business process enactment and emerging business process affordances. Such insights are crucial to ensure that inferences can be drawn in order to answer the research question.
4  REFLECTIVE ANALYSIS OF PILOT STUDY

The first part of the current chapter introduces the background of the process redesign project. The problems identified by consultants within the payroll process enactment are outlined and the changes undertaken by management to improve process performance are described.

The second section of the chapter looks into business process action opportunities that emerged after the process redesign changes were implemented. Process affordances together with design changes that enabled these affordances to emerge are identified for both administrative and payroll staff. Visual representation of the changes and affordances using the proposed AAF model (see Figure 2.9) is also provided.

The third part of the chapter explores the effects of the payroll process redesign. This is done through the reflection on process affordances identified in the previous section and their influence on process enactment.

The last section of the chapter preliminary evaluates the proposed framework. Specific stages of the pilot study are looked at and reflection on how the model facilitated the analysis of the process environment, its changes, and their effects, is undertaken.

4.1  Business Process Changes

During the implementation of an ERP system in a corporate group of Australian companies providing integrated waste management services for private and industrial customers, external consultants conducted the review of payroll process. Significant ineffectiveness and inefficiencies were identified. At one end of the process, employees in each company were entering their hours worked onto timesheets, which were then submitted manually to their operational managers for authorisation for the subsequent data entry and processing. Errors in data entry and
processing were quite common; consequently, corrections and adjustments had to be made regularly. This problem was further complicated by security issues in smaller companies, where sensitive payroll reports were commonly sent to the shared printers, potentially accessible by unauthorised personnel. Moreover, due to complicated legislation, payroll procedures required employees servicing the process to have very extensive knowledge. This knowledge, simply did not exist in some smaller member companies, especially those functioning in remote areas. Due to the above problems, instances when payments to the employees were in error or delayed were not uncommon.

Corporate management of the group with a team of external consultants reviewed the payroll process in detail and the recommendations adopted and implemented over a six-month period are described below. The major change in the payroll process related to its consolidation on a group level. While people were still employed by different member companies, it was decided that only one payroll department would became responsible for the overall payroll processing. To take advantage of the existing expertise in handling large payroll runs, the payroll department from the company employing the largest number of staff within a group took on the role of the overall payroll processing. A new member of staff was employed to assist in handling the newly generated workload, while payroll personnel in smaller companies were released to other non-payroll related jobs.

Another change introduced by the review related to the timesheet and plant sheet entry. Originally, data was entered by the payroll department after the administration staff of each operational unit collected the applicable forms and organised the authorisation of a relevant manager. After the change, the administrative staff became responsible for entering into the system the data from collected timesheets which were then approved by the relevant managers online.

The improved payroll also required changes to the working environment. For example, the payroll office had to be moved to new office space and the furniture layout was adjusted to ensure that the staff could face people entering the room. A new laser printer dedicated to payroll was placed at the back of the new office space.
The design of payroll forms, data entry screens, and reports within the ERP system were unified throughout the group and simplified by deleting or hiding unnecessary information and functionality.

Specific business rules were enforced within processes, and implemented in the new information system. The system warned payroll officers about the occurrence of exceptions. For example, warnings were raised during timesheet data entry when a timesheet had more than eight hours of overtime; or at the payroll processing stage when net pay for an employee of a specific company exceeded a specified amount. Additionally, payment was automated by generating and submitting bank files from payroll data.

Payroll employees responsible for the new process were sent for comprehensive payroll training to ensure that their expertise level matched their increased responsibilities. A hierarchical structure of internal training was introduced. Payroll staff became responsible for the internal training of administrative staff in online timesheet entry, who in turn were accountable for training employees in filling in the timesheets. A summary of the changes in the payroll process is presented in Table 4.1.

Table 4.1: Payroll process changes adopted during the redesign project.

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4.2 Business Process Affordances

In this pilot study, the payroll process as a whole was considered to be the activity system. Each element in the activity framework was first considered from particular stakeholder perspectives. This was crucial because, as explained earlier, affordances are essentially relational. All previously described changes in the process design offered new and direct affordances to two groups of subjects, specifically, administrative and payroll staff.

4.2.1 Administrative Staff Perspective

Changes in the payroll process facilitated the emergence of new process affordances (illustrated in sections 2.2.2 and 2.3) for administrative staff. These changes are shown in the corresponding affordance triangles of the AAF (see Figure 2.9) which is reproduced in Figure 4.1. For example, functional affordances were enabled by a new ERP system providing new functionalities such as standardised forms, simplified menus, exception warnings, online timesheets and plant sheets. New physical affordances emerged in the form of manipulation affordances as people had to operate the hardware to use the ERP system; and sensory affordances as it was easier for people to notice the required information on simplified menus, standardised forms, A4 reports or when the exception warning was displayed. New social affordances were enabled when the internal training and mutual interaction improved collaboration between the process subjects and customers. Finally, the process changes facilitated the emergence of psychological affordances, specifically cognitive and emotional/motivational. Cognitive affordances emerged as it was easier to learn and know how to enter the data and report on it with simplified menus, standardised forms and exception warnings. Emotional/motivational affordances emerged as people were satisfied when the process was performed on time and did not require extensive corrections, and also when they felt part of the payroll process team.
4.2.2 Payroll Staff Perspective

Changes in the payroll process also facilitated the emergence of new process affordances (illustrated in sections 2.2.2 and 2.3) for payroll staff (see Figure 4.2). For example, functional affordances were enabled by the new ERP system providing new functionalities such as standardised forms, simplified menus, exception warnings, pay automation and payment summaries. New physical affordances emerged in the form of layout affordances with a new office, furniture layout and dedicated payroll equipment; manipulation affordances as people had to operate the hardware to use the information systems; and sensory affordances as it was easier for people to notice the required information on simplified menus, standardised forms, A4 reports or when the exception warning was displayed. New social affordances were enabled when the internal training and mutual interactions with administrative staff improved cooperation between the process subjects. Finally, the process changes facilitated the emergence of psychological affordances: cognitive, as it was easier to know how to enter the data and report on it after the advanced training and with
simplified menus, standardised forms, and exception warnings; and emotional and motivational as people were satisfied when the process was performed on time and did not require extensive corrections and when they felt part of the team with administrative staff. The changes to the business process that facilitated the emergence of affordances for payroll staff are summarised in the relevant triangles of Figure 4.2.

![Figure 4.2: Payroll process design changes for payroll staff.](image)

### 4.3 Business Process Redesign Effects

Following the redesign, problems began to be corrected closer to the point of their occurrence within a process and the positive effects were quickly noticed. Increased interaction between administrative staff and workers made employees more aware of the need to submit quality data to avoid problems downstream in the data processing chain. This was evidenced in increased legibility of hand-written timesheets. Within the first few months, the number of instances when employees complained to the payroll department about their pay being incorrect significantly diminished. The time required for timesheet entry decreased and there were no
more instances of pay being delayed. The feedback from process customers confirmed that they are more confident about the security and accuracy of their pay after the change.

For both, administrative and payroll staff, the sensory physical affordances (illustrated in sections 2.2.2 and 2.3) facilitated by simplified menus, standardised forms and reports, as well as functional affordances (illustrated in sections 2.2.2 and 2.3) offered through the new information system, facilitated more accurate and timely pay processing. Additionally, for payroll staff, the layout physical affordances (illustrated in sections 2.2.2 and 2.3) of a new office, furniture arrangements and dedicated payroll equipment facilitated more secure pay processing. Finally, for both administrative and payroll employees, social affordances (illustrated in sections 2.2.2 and 2.3) assisted by training and mutual interactions, and psychological affordances (illustrated in sections 2.2.2 and 2.3) enabled by training, simplified menus, standardised forms and reports, facilitated perception, cognition, learning and motivation, and led to faster and more accurate payroll processing.

On reflection, the majority of problems with the old system could be traced back to insufficient process affordances. This stemmed from inadequate design of the system’s functional and physical attributes and a misalignment between the system operation and the level of preparedness and expectation of individual staff. Outcomes of new process affordances for administrative and payroll staff in the form of improving skilled labour and accurate, timely and secure timesheet and pay processing contributed to the fulfilment of process goals. The redesign had a significant positive impact on system efficiency and effectiveness, and some interesting affordance-motivated changes to business practices and environmental design. The pilot study illustrates how process improvement could be achieved with the emergence of affordances.

4.4 AAF Model Evaluation

The Affordance Activity Framework illustrated in section 2.5 and presented in Figure 2.9 played an important part in the thematic analysis of the pilot study. This section
describes the specific stages of the analysis and how the model was used. Firstly, different elements of the business context in question were mapped to the specific elements of the AAF model and listed as presented in Figure 4.3. For example, administrative staff became the subject of the process; stationery and the ERP system became process inputs; employees became process stakeholders; legislation such as National Employment Standards, the Privacy Act 1988 and organisational guidelines such as consolidated payroll processing became process rules; timesheet collection and entry became process division of labour; and finally the effective and efficient payroll processing became process objective.

Figure 4.3: Elements of business context mapped to the elements of AAF model.

In the next stage of reflective analysis of the study I looked closely at all the changes introduced in the process and investigated new affordances that emerged for the specific subject due to those changes. Once the affordance was identified the change was listed in the AAF model triangle corresponding to the affordance category. For
example, for administrative staff, a simplified menu in a new ERP system facilitated the emergence of multiple categories of action opportunities. Firstly, physical affordances for manipulation by clicking the menu and sensing the required choice were possible. Secondly, psychological affordances made the perception of the specific system options easier. Finally, functional affordances were triggered when specific manipulation evoked the desired function. The simplified menu change was therefore listed in the overlapping area of physical, functional and psychological triangles as shown in Figure 4.4. Online timesheet entry facilitated the emergence of functional affordances so further process steps such as automatic pay calculations could be performed. The online timesheet entry change was therefore listed in functional affordances triangle as presented in Figure 4.4. Internal training facilitated the emergence of psychological action opportunities as staff improved their knowledge, and social action opportunities as staff interacted together. The internal training change was therefore listed in the overlapping area of psychological and social triangles of the model as illustrated in Figure 4.4.
Finally, once the new process affordances were identified, their effects on subject actions and the payroll process as a whole were explored. For example, administrative staff became more skilled in their process tasks and collaborated better with the payroll staff which in turn led to more accurate and timely timesheet entry. The effects were summarised as the outcome of the AAF model as presented in Figure 4.5. This is followed by Table 4.2 summarising the utilisation of the AAF model in the pilot study.

**Figure 4.5: Process outcome after the changes.**

**Table 4.2: Steps for utilisation of the AAF in reflective analysis of the pilot study.**

<table>
<thead>
<tr>
<th>STAGE</th>
<th>ACTION</th>
<th>DETAILS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mapping elements of the business context to the specific elements of AAF model</td>
<td>Replacing AAF elements with the elements identified in the specific business context</td>
</tr>
<tr>
<td>2</td>
<td>Looking for changes in the business processes and investigating new affordances that emerged after those changes</td>
<td>Listing the changes in the appropriate triangles representing different affordance categories in AAF model</td>
</tr>
<tr>
<td>3</td>
<td>Exploring effects of the new affordances for process subjects and the business</td>
<td>Listing the effects of the changes under the outcome of the AAF model</td>
</tr>
</tbody>
</table>
As demonstrated in the current section, the AAF model discussed in section 2.5 and presented in Figure 2.9 was utilised in the reflective analysis of the pilot study. The analysis confirmed that all elements of the conceptual framework are clearly visible during the business process enactment. It also illustrated that the process design changes that facilitated the emergence of new process affordances and the outcomes of those changes can be presented in the relevant triangles and the outcome area of the model. Overall the framework facilitated the visual representation of the process environment, its changes and their effects, and passed the preliminary test of its utility.

4.5 Chapter Summary

The pilot study showed that process improvement could be achieved with the emergence of process affordances. The investigation confirmed that all the elements of the conceptual framework (process subject, stakeholders, inputs, rules and the division of labour) illustrated in section 2.5 and presented in Figure 2.9 are clearly visible during the business process enactment and can be utilised in the process design. The chapter illustrated that the process design changes that facilitated the emergence of new process affordances and the outcomes of those changes can be presented in the relevant affordance triangles and the outcome area of the model. Overall, the framework facilitated the visual representation of the process environment, its changes and their effects, and passed the preliminary test of its utility.

While the pilot study was useful for a preliminary exploration of the AAF model, it concentrated on one specific business process enacted in one specific organisation, therefore it did not investigate interdependencies between the sociocultural context of business processes and affordances in sufficient depth. Hence, in the next stage the research explored the business process enactment experiences of 16 individuals in order to further evaluate the framework and discover in more depth aspects that enable the emergence of different process affordances and facilitate people’s perception of such affordances.
5 HERMENEUTICAL PHENOMENOLOGICAL ANALYSIS OF INTERVIEWS

This chapter undertakes the analysis of data collected during the interviews by following the methodological process detailed in chapter 3. The first part elaborates the details of data collection, which was previously designed and explained in section 3.3.1. It provides the reader with the co-researchers’ personal and professional background, much of which emerged in the process of data collection. It is important for the reader to refer to these details while exploring their lived experiences presented in this and the following chapters.

The second part of the chapter deals with epoché and illustrates biases I am likely to bring to my study. This stage is an essential step of the chosen methodology (as explained in section 3.3.2.2.1) as writing down preconceptions and presuppositions allows the researcher to become aware of their prejudgements and reduces the influence of biases on the research.

The final section of the chapter undertakes phenomenological reduction in order to prepare textural descriptions of the co-researchers’ experiences. It is an intentionally long section to illustrate how the codes and themes were determined and how understanding of the lived experiences was shaped. In an iterative and reflective series of steps performed in line with the hermeneutical process detailed in section 3.3.2.2.2 I examine qualities of business process enactment experiences in order to prepare individual textural descriptions. Those descriptions represent a narrative of each interview grouped along the discovered themes and codes. The section culminates in the composite textural description which explores how the issues were shared between different co-researchers.

5.1 Data Collection

Over the course of this research 24 people were approached and 16 agreed to participate and were subsequently interviewed. Interviews were conducted as long
as new insights were still being gained and no saturation point achieved on issues relevant to the research question. Potential co-researchers were first approached to determine both their suitability and willingness to participate in the study. Eight contacts were obtained through an ERP consultancy company. These people had recent experience with the implementation of information systems. Eight contacts were approached among professional and business people in my acquaintance who I believed might be suitable co-researchers. The remaining eight were recommended by people known to me from academia and social interactions. Out of the group, five contacts were unwilling to participate while three were involved in industries and processes already represented by other co-researchers. 16 contacts were given the Plain Language Statement explaining the nature and details of the study. All made an informed decision and signed the consent form for the study.

To increase the research transferability (see section 3.3.3.2) an attempt was made to select a wide range of participants. Interviewees came from different industries, such as finance, manufacturing, education, engineering, IT, medical, and trade. They also worked for different types of business: small, medium and large. Participants had experience in enacting different types of processes, such as design, customer service, human resources (HR), management, manufacturing, sales and purchases. Some had experience of working in more than one industry and were involved in multiple business processes. They also had different roles in the organisation, such as employees, managers and directors. Care was taken to ensure that some co-researchers had experience of process design (8). Finally, basic demographic features were also considered. Participant were off different age, such as 20s, 30s, 40s and 50s; and gender (10 males and 6 females). Education of co-researchers varied from high school and trade school to technical college and university. Participants came also from different cultural backgrounds, such as Australia (7), Europe (5), Asia (2), Africa (1) and South America (1). Table 5.1 lists the co-researchers and presents their characteristics.
<table>
<thead>
<tr>
<th>#</th>
<th>NAME (AUS)</th>
<th>BUSINESS TYPE</th>
<th>CURRENT ROLE</th>
<th>INDUSTRY EXPERIENCE</th>
<th>BUSINESS PROCESS EXPERIENCE</th>
<th>EDUCATION</th>
<th>AGE</th>
<th>GENDER</th>
<th>BACKGROUND</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>C1</td>
<td>Dentist</td>
<td>Manager</td>
<td>Medical</td>
<td>Design, Management, Customer Service, Purchases, HR</td>
<td>University</td>
<td>40s</td>
<td>Female</td>
<td>Europe</td>
</tr>
<tr>
<td>2</td>
<td>C2</td>
<td>ERP Consultant</td>
<td>Employee</td>
<td>IT</td>
<td>Design, Customer Service</td>
<td>University</td>
<td>30s</td>
<td>Male</td>
<td>Asia</td>
</tr>
<tr>
<td>3</td>
<td>C3</td>
<td>IT Director</td>
<td>Employee</td>
<td>Large</td>
<td>Design, Management, HR</td>
<td>University</td>
<td>50s</td>
<td>Male</td>
<td>Australia</td>
</tr>
<tr>
<td>4</td>
<td>C4</td>
<td>Brazilian</td>
<td>Manager</td>
<td>IT</td>
<td>Design, Customer Service</td>
<td>University</td>
<td>20s</td>
<td>Female</td>
<td>Asia</td>
</tr>
<tr>
<td>5</td>
<td>C5</td>
<td>Fleet Manager</td>
<td>Manager</td>
<td>Large</td>
<td>Design, Management, Purchases, HR</td>
<td>University</td>
<td>50s</td>
<td>Male</td>
<td>Europe</td>
</tr>
<tr>
<td>6</td>
<td>C6</td>
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<td>Manager</td>
<td>Large</td>
<td>Design, Management, Purchases, HR</td>
<td>University</td>
<td>20s</td>
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<td>Europe</td>
</tr>
<tr>
<td>7</td>
<td>C7</td>
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<td>Design, Management, Purchases, HR</td>
<td>University</td>
<td>40s</td>
<td>Male</td>
<td>Australia</td>
</tr>
<tr>
<td>8</td>
<td>C8</td>
<td>Not-For-Profit Manager</td>
<td>Manager</td>
<td>Medium</td>
<td>Manufacturing, Sales, HR</td>
<td>University</td>
<td>50s</td>
<td>Male</td>
<td>Australia</td>
</tr>
<tr>
<td>9</td>
<td>C9</td>
<td>Timber Salesman</td>
<td>Employee</td>
<td>Medium</td>
<td>Manufacturing, Sales, HR</td>
<td>University</td>
<td>40s</td>
<td>Female</td>
<td>Europe</td>
</tr>
<tr>
<td>10</td>
<td>C10</td>
<td>Product Designer</td>
<td>Employee</td>
<td>Large</td>
<td>Manufacturing, Sales, HR</td>
<td>University</td>
<td>30s</td>
<td>Male</td>
<td>Europe</td>
</tr>
<tr>
<td>11</td>
<td>C11</td>
<td>Microbiologist</td>
<td>Employee</td>
<td>Large</td>
<td>Manufacturing, Sales, HR</td>
<td>University</td>
<td>40s</td>
<td>Male</td>
<td>Europe</td>
</tr>
<tr>
<td>12</td>
<td>C12</td>
<td>Electrician</td>
<td>Employee</td>
<td>Large</td>
<td>Manufacturing, Sales, HR</td>
<td>University</td>
<td>40s</td>
<td>Male</td>
<td>Europe</td>
</tr>
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<td>C13</td>
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<td>Employee</td>
<td>Medium</td>
<td>Manufacturing, Sales, HR</td>
<td>University</td>
<td>30s</td>
<td>Male</td>
<td>Europe</td>
</tr>
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<td>C14</td>
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<td>Employee</td>
<td>Medium</td>
<td>Manufacturing, Sales, HR</td>
<td>University</td>
<td>30s</td>
<td>Male</td>
<td>Europe</td>
</tr>
<tr>
<td>15</td>
<td>C15</td>
<td>Teacher</td>
<td>Employee</td>
<td>Medium</td>
<td>Manufacturing, Sales, HR</td>
<td>University</td>
<td>30s</td>
<td>Male</td>
<td>Africa</td>
</tr>
<tr>
<td>16</td>
<td>C16</td>
<td>Accountant</td>
<td>Employee</td>
<td>Medium</td>
<td>Manufacturing, Sales, HR</td>
<td>University</td>
<td>30s</td>
<td>Male</td>
<td>Australia</td>
</tr>
</tbody>
</table>

Table 5.1: Co-researchers (anonymised) involved in the study.
Sixteen interviews between 1 and 2 hours duration were conducted. Each interview was digitally recorded. Thirteen interviews were transcribed by professional services while three, due to their very strong accents, were transcribed by me. All transcripts were double checked by me for their accuracy. Verified transcripts were given to all co-researchers for validating their content. All participants confirmed the transcript with one requesting a small change in the name of his industry (C9) and two e-mailing short descriptions of additional experiences reflecting cultural differences (C6) and non-working equipment (C8). Another two co-researchers requested keeping the name of their company confidential, which as a condition of my research ethics approval was compulsory anyway. Verified and validated transcripts were organised by referencing every statement with the co-researcher’s alias followed by a space and a statement number in square brackets. For example, the first statement from the interview with the first co-researcher C1 was labelled as [C1 1] thus:

**Researcher:** “Could you please briefly tell us about your organisation? Basically what kind of business are you in? How long have you been in this business? What sector? What industry?” [C1 1]

The second statement from the same co-researcher was labelled [C1 2] thus:

**Co-researcher:** “We are in medical so this is a dental practice. There is ... I am a sole-trader. There is ... how many people employed here including me? 5 people employed here: 2 part-time receptionists, 2 part-time nurses, one of them is still at training, me dentist and I am managing this practice.” [C1 2]

Identifiers facilitated work with large volumes of textural data typical for qualitative research. Such references enabled quickly finding the relevant text during frequent referrals to the transcripts common in the hermeneutical phenomenological analysis conducted in the following sections.
5.2 Epoché

5.2.1 Self-reflection before the Study

One of the major influences motivating the current study is my past experience with implementing ERP systems and associated business process redesign as well as my exposure to resolving the issues encountered during the post-design process enactment. Being a task-oriented individual and at the same time a very rational and organised person, I may be inclined to look for rational solutions to every problem I encounter. My involvement in the business process domain constructed my understanding of the process design, an understanding that may create a tendency to favour particular ways of designing processes in organisations and particular methodologies to communicate them to the participants. I have the opinion that information systems, and ERP systems in particular, are beneficial to business process enactment and that such systems facilitate the flow of information between the process participants and enhance process effectiveness and efficiency. I also hold the view that effectiveness and efficiency should be the main concerns during the process design and that with appropriate training process participants will see the benefits of improvements and accept them. Opinions and judgements about the business processes I have developed during my professional practice have the potential to influence the study as it could potentially bias my perception of co-researchers’ accounts of their experiences. I recognise and accept that these are the biases that I bring to my research and will endeavour to avoid imposing these presumptions on this research.

5.2.2 Self-reflection after the Whole Study

During extensive reading for the literature review process I immersed myself in the subject of business processes, affordances and Activity Theory. Although I discovered sociotechnical trends within academia advocating relationships between technical and social aspects of the processes, my rationality and task-oriented attitude prompted me to treat them with some scepticism. This was further enforced by prevailing trends in business process theory and practice concentrating on rational
solutions. While thematic analysis of a pilot study showed that the success of the redesign project could at least partially be attributed to the improvement of psychological and social aspects for process subjects, it was still a surprise to find that some co-researchers regularly involved in business processes emphasised people capabilities and culture as two of the most influential forces behind business actions. Interviews revealed many unexpected insights into the research domain. In particular, co-researchers’ experiences with people who they perceived as having inadequate ability for their required positions, as well as experience working with people from different cultures, induced me to revisit my presuppositions and acknowledge the importance of human factors, such as motivation, emotions, and social interaction, and the necessity to address them during the design process.

5.3 Phenomenological Reduction

As explained in section 3.3.2.2.2 the process of phenomenological reduction is aimed at exploring co-researchers’ stories and presenting them in the form of textural descriptions.

5.3.1 Individual Textural Descriptions

The preparation of narratives clarifies what we see and helps us to recognise and identify relevant qualities of what was experienced (Moustakas 1994). Describing the experience encourages us to look again and discover layers of meaning by interweaving person, experience and phenomenon. This in turn was used in later stages of the data analysis to determine how process enactment was experienced (Creswell 2007).

For the sake of brevity only two summaries of individual textural descriptions are provided here (C3 and C11) while the full textural descriptions of these interviews are included in Appendix 2. Space restrictions did not allow me to provide individual textural descriptions of other co-researchers but if required they are available on request.
The selected co-researchers represented different organisational levels (director and employee), different industries (IT and science) and different organisations (global manufacturing corporation and local laboratory). In addition, they represented different genders, ages (50s and 40s) and background (Australian and South American).

5.3.1.1 Interview 3 Précis

The most prominent theme in the process enactment experiences of C3 was culture. Culture influenced people’s objectives and motivations. For example, a financial controller working in Japan suppressed his capabilities so he could fit into the workplace. Culture also affected what instruments people used. For example, in Thailand employees preferred spreadsheets over the ERP system. Culture could also shape how working space was organised. For example, in Japan staff sat at little desks in open rooms and managers faced and watched them. Culture influenced also how people cooperated with each other. For example, managers’ requests were followed in some Asian cultures while they were regularly questioned in western ones. The discussion with C3 also included customary rules in business engagements and the language proficiency required in international dealings. For example, paying a fee under the counter was expected in some countries but banned in others. The strong influence of culture in many aspects of business process enactment affected process effectiveness and efficiency. For example, a planner in China did not understand the training provided and used the material requisition planning (MRP) system incorrectly which impacted manufacturing targets. Habitual questioning of operational methods in Australia and New Zealand delayed deployment of a wide area network and incurred additional costs.

5.3.1.2 Interview 11 Précis

C11 experiences of significant changes in the business processes lead to decrease in motivation and it was the motivation theme that stood out the most in her interview. Motivated people paid better attention to what they were doing, took ownership of
their job and readily collaborated with others. C11 reflected that employees in organisations who were motivated were more inclined to do what was good for the business by working more effectively and efficiently. While financial rewards were important they were not enough to guarantee employee satisfaction. Interaction with others was another motivational tool which helped people to feel part of the team and be happier. C11 believed that businesses should ensure that the work is challenging and that regular training is provided so that staff keep up to date with the relevant knowledge and are aware of their career progress. Finally, instruments used within the process were discussed. These should function properly so people do not become frustrated with their tasks.

5.3.2 Listing and Preliminary Grouping

Working through the interview transcripts I extracted phrases that related to the process enactment and assigned preliminary codes to represent them. As described in section 3.3.2.2.2.1, open coding was applied to transcripts to identify aspects of business process enactment that had some importance for co-researchers. For example, one co-researchers’ interview reported a story about a dental chair that often broke down and how the replacement created new problems due to the chair’s location in relation to the plumbing. I identified the codes such as: instruments, reliability, changes and physical layout. For the sake of brevity, the examples of each co-researcher’s statements and their preliminary coding are presented in Appendix 3.

The preliminary codes were subsequently reviewed and those with similar meaning in the relevant context were amalgamated. For example, some co-researchers talked about the importance of the backup and some discussed how important the reliability of the instruments was. Both backup and reliability represented similar meaning and where combined into a new reliability common code. Specific adjustments to the preliminary codes and reasons behind them are presented in Table 5.2.
Table 5.2: Changes in preliminary coding.

<table>
<thead>
<tr>
<th>PRELIMINARY CODE</th>
<th>CHANGE</th>
<th>REASON</th>
</tr>
</thead>
<tbody>
<tr>
<td>Backup</td>
<td>Replaced with Reliability</td>
<td>Similar meaning</td>
</tr>
<tr>
<td>Body of Knowledge</td>
<td>Replaced with Knowledge</td>
<td>For the Body of Knowledge to be used within the process it has to become the subject’s Knowledge</td>
</tr>
<tr>
<td>Facilities</td>
<td>Replaced with Instruments</td>
<td>Instruments include Facilities</td>
</tr>
<tr>
<td>Performance Measurement</td>
<td>Replaced with monitoring</td>
<td>Monitoring includes Performance Measurement</td>
</tr>
<tr>
<td>Practicality</td>
<td>Replaced with Reasonableness</td>
<td>Reasonable includes Practical</td>
</tr>
<tr>
<td>Return on Investment (ROI)</td>
<td>Replaced with Best Structure</td>
<td>Best structure related to achieving the best ROI</td>
</tr>
<tr>
<td>Simplicity</td>
<td>Replaced with Easiness</td>
<td>Similar meaning</td>
</tr>
<tr>
<td>Training</td>
<td>Replaced with Learning</td>
<td>Learning includes Training</td>
</tr>
<tr>
<td>Teamwork</td>
<td>Replaced with Collaboration</td>
<td>Similar meaning</td>
</tr>
<tr>
<td>Visibility</td>
<td>Replaced with Transparency</td>
<td>Similar meaning</td>
</tr>
</tbody>
</table>

As a result I arrived at 51 common codes listed in Table 5.3 which represented various aspects of business processes that had some significance to co-researchers during the enactment.

Table 5.3: 51 common codes.

<table>
<thead>
<tr>
<th>COMMON CODES</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
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<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
<th>17</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMMON CODES</td>
<td>Automation</td>
<td>Best Structure</td>
<td>Capabilities</td>
<td>Challenge</td>
<td>Changes</td>
<td>Clarity</td>
<td>Collaboration</td>
<td>Communication</td>
<td>Compliance</td>
<td>Culture</td>
<td>Customer Service</td>
<td>Documentation</td>
<td>Easiness</td>
<td>Effectiveness</td>
<td>Efficiency</td>
<td>Experience</td>
<td>Flexibility</td>
</tr>
<tr>
<td>CODE</td>
<td>18</td>
<td>19</td>
<td>20</td>
<td>21</td>
<td>22</td>
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<td>30</td>
<td>31</td>
<td>32</td>
<td>33</td>
<td>34</td>
</tr>
<tr>
<td>CODE NAME</td>
<td>Human Errors</td>
<td>Information</td>
<td>Instruments</td>
<td>Integration</td>
<td>Interaction</td>
<td>Knowledge</td>
<td>Language</td>
<td>Learning</td>
<td>Management</td>
<td>Meetings</td>
<td>Mobility</td>
<td>Monitoring</td>
<td>Motivation</td>
<td>Ownership</td>
<td>People Involvement</td>
<td>Physical Layout</td>
<td>Planning</td>
</tr>
<tr>
<td>CODE NUMBER</td>
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<td>37</td>
<td>38</td>
<td>39</td>
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<td>41</td>
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<td>47</td>
<td>48</td>
<td>49</td>
<td>50</td>
<td>51</td>
</tr>
</tbody>
</table>
5.3.3 Reduction and Elimination

As described in section 3.3.2.2.2.2, the purpose of reduction and elimination is to arrive at horizons of experience, a perspective of specific co-researchers on business process enactment and emerging process affordances. To identify such a perspective I reflected on each transcript and eliminated statements that were vague, repetitive or overlapping. Subsequently, using Excel I grouped statements with the same code so that co-researchers’ views on specific issues could be fully presented and easily referred to. For example, co-researcher C1 in statement 19 talked about getting annoyed when the HICAPS machine was not working properly. In her statement 35 she talked about digitalisation of records which made her work much easier. Both statements related to instruments and technologies used within processes, and were consequently grouped together. For the sake of brevity, examples of expression grouping for three co-researchers are presented in Table 5.4.

<table>
<thead>
<tr>
<th>STATEMENT ID</th>
<th>STATEMENT</th>
<th>COMMON CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1 19</td>
<td>“When you are claiming from the insurance, they give you money straight to your bank account. But sometimes this machine that I have, it lies. It says that I was paid but I didn’t get any money. And I had to discover this sometimes the hard way (…) like I discovered this after a year so I can’t go back that far.”</td>
<td>Instruments Technology</td>
</tr>
<tr>
<td>C1 35</td>
<td>“It is easier. When you’ve got digital you can enlarge it and see it in a bigger picture. I can then email to specialists and there was only one copy, the old way. So now I can just print out as many copies as I wish.”</td>
<td>Instruments Technology Collaboration</td>
</tr>
<tr>
<td>C6 46</td>
<td>“All meeting offices have the device on the round table which is the camera which enables [you] to connect to that. It’s as simple as plugging the cable to the computer, firing up the live meeting and you can just participate in anything. Also it means that you can dial in from, you can use your phone, you can use any device to connect to the meeting (…) It works from everywhere so it connects everyone wherever they are.”</td>
<td>Collaboration Communication Technology Meetings Mobility</td>
</tr>
<tr>
<td>C6 51</td>
<td>“We also discovered that nothing really replaces face to face cooperation and sending the senior researchers to a remote lab and spending a week there and training them makes much better – creates a much better atmosphere, friendship, cooperation and actually delivers much better results than sending so many emails.”</td>
<td>Collaboration Communication Meetings</td>
</tr>
</tbody>
</table>
The system that I currently use is very basic and only just adequate. From what I can gather with it, it covers generally three quarters of what I need to do without too many issues. About another 25% does require a lot of manual input, it does require review, whatever the computer is able to give back to me by way of reporting, it may need quite a lot of adjustment manually to ensure that it is correct.”

“I am used to having my own office in the past in other work environments, but this particular space that I work in I find quite isolating (...) the layout of the office itself is wrong, I have my back to the door rather than the other way around, and that just doesn’t work.”

Subsequently each common code that emerged in the co-researchers’ experiences was looked at again and through the condensation of meaning the relevant statements were rewritten. That way I arrived at a horizon of understanding business process enactment experience for each co-researcher. For the sake of brevity two such horizons for co-researchers (C3 and C11) are presented in Table 5.5 and Table 5.6 and the horizons for the remaining co-researchers are included in Appendix 4. To show the continuity of the data analysis stage, I follow co-researchers C3 and C11 (see section 5.3.1).

5.3.3.1 Horizon of Experience for C3

Working at the high level of organisational hierarchy, C3 focused on process effectiveness and efficiency. He tried to achieve process objectives by implementing technological solutions across the business, but stressed the importance of operational people involvement in the process design to ensure that the relevant instruments deliver the required functionality. The implementation of IT tools at different sites required collaboration across geographical locations, and culture became an important consideration as it influenced the way people used instruments, interacted with each other, and complied with the relevant rules. Table 5.5 shows a horizon of experience for business process enactment of C3 with 36 common codes and the relevant context.
<table>
<thead>
<tr>
<th>COMMON CODES</th>
<th>CONTEXT (IT/MANUFACTURING, LARGE CORPORATION)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automation</td>
<td>Automation facilitated by technology made the processes more efficient. In some cases however it was not desirable as it could lead to a decrease in ROI (best structure).</td>
</tr>
<tr>
<td>Best Structure</td>
<td>Different regulations in different locations presented the opportunity to set different structures. The best process was not necessarily the most efficient but the one that created the best structure and provided the business with the biggest return, for example tax savings.</td>
</tr>
<tr>
<td>Capabilities</td>
<td>People capabilities determined how they could enact the processes but in some cases process subjects did not use their skills as it was not expected in their workplace culture.</td>
</tr>
<tr>
<td>Changes</td>
<td>Change is always going to be in business and when people are motivated enough they will support it.</td>
</tr>
<tr>
<td>Collaboration</td>
<td>Collaboration could be facilitated by communication which in turn could be enabled by technology. It was also influenced by culture which determined how people treat and relate to each other.</td>
</tr>
<tr>
<td>Communication</td>
<td>Communication facilitated collaboration but could be difficult across the globe when people lived in different time zones and spoke different languages.</td>
</tr>
<tr>
<td>Compliance</td>
<td>Compliance with different regulations in different business locations could be challenging. Different legislations presented the opportunity to set the best business structure. Cultural norms were the most difficult to monitor and could influence compliance with other rules.</td>
</tr>
<tr>
<td>Culture</td>
<td>Culture was one of the most important aspects of work influencing usage of instruments, collaboration, compliance with rules, and utilisation of people capabilities.</td>
</tr>
<tr>
<td>Documentation</td>
<td>Every change in the process should be documented so it can be referred back to and evaluated in the future.</td>
</tr>
<tr>
<td>Effectiveness</td>
<td>For the processes to be effective, operational people should be involved in their design.</td>
</tr>
<tr>
<td>Efficiency</td>
<td>Efficiency drove many processes and their changes but best structure bringing the highest ROI was more important.</td>
</tr>
<tr>
<td>Human Errors</td>
<td>Different cultures had different tolerance for peoples’ poor performance. While in Asia tolerance was high, in western countries it was quite low.</td>
</tr>
<tr>
<td>Information</td>
<td>Information was derived from data stored in the systems but it was up to people to use it to improve the processes.</td>
</tr>
<tr>
<td>Instruments</td>
<td>Instruments could improve sharing knowledge, collaboration and make processes more effective and efficient.</td>
</tr>
<tr>
<td>Integration</td>
<td>Integration of relevant instruments made work more effective and efficient, i.e. new project system integrated with BI solution.</td>
</tr>
<tr>
<td>Knowledge</td>
<td>Knowledge could be gained through training, experience and technological solutions.</td>
</tr>
<tr>
<td>Language</td>
<td>Cross-country dealing created language issues which make communication challenging.</td>
</tr>
<tr>
<td>Learning</td>
<td>Learning was facilitated by training and made easier by visual aids such as flowcharts. Training was required when new systems were implemented so people gained knowledge of how to use them. It was also a motivational tool. In some cases training failed, for example with high employee turnover.</td>
</tr>
<tr>
<td>COMMON CODES</td>
<td>CONTEXT (IT/MANUFACTURING, LARGE CORPORATION)</td>
</tr>
<tr>
<td>-----------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Management</td>
<td>Managers determined the utilisation of resources and required transparent systems so their employees and projects were visible.</td>
</tr>
<tr>
<td>Meetings</td>
<td>Meetings had to be frequently organised to ensure good communication.</td>
</tr>
<tr>
<td>Monitoring</td>
<td>A new information system was implemented to monitor employees so the management was aware what they were working on and who could be used on other projects.</td>
</tr>
<tr>
<td>Motivation</td>
<td>Motivated people were more inclined to do what was good for the business as the organisation’s gain was also their own. Motivation could be provided by supporting skills development and long term career opportunities.</td>
</tr>
<tr>
<td>Ownership</td>
<td>With good motivation people goals were aligned to the company and people owned their work.</td>
</tr>
<tr>
<td>People Involvement</td>
<td>Involving people in the design process ensured that business requirements were understood, the projects that needed to be done were visible and could be managed, and people supported the processes.</td>
</tr>
<tr>
<td>Power</td>
<td>Power structure in a particular culture determined how people did things and through that influenced process enactment. For example, employees listened to managers in Asia but questioned them in the western culture.</td>
</tr>
<tr>
<td>Process Bypassing</td>
<td>Following the process by people was the most challenging aspect of processes.</td>
</tr>
<tr>
<td>Quality</td>
<td>Business should concentrate on products and locations where good quality could be delivered. It was better to concentrate on a few things you did well then on many things you did mediocrly.</td>
</tr>
<tr>
<td>Reasonableness</td>
<td>Unreasonable rules could lead to closing down the business in specific location, i.e. Australian rules about mandatory red brakes for prams.</td>
</tr>
<tr>
<td>Rigidity</td>
<td>Rigidity was required in some processes so information systems were able to cater for such processes.</td>
</tr>
<tr>
<td>Stakeholders’ Conflict</td>
<td>Conflict was inherent within some processes as people perceived the world differently and made different decisions (employees, managers, executives).</td>
</tr>
<tr>
<td>Standardisation</td>
<td>Standardisation was required within the process so information systems were able to support it. For example, the sales process was the same across the globe as the same products were sold, although minor flexibility (such as prices) was required.</td>
</tr>
<tr>
<td>Technology</td>
<td>Technology could make processes more efficient. All technological difficulties could be dealt with in time.</td>
</tr>
<tr>
<td>Transparency</td>
<td>Process transparency was required so everyone involved had access to information on regions, tasks, milestones, issues, risks, employee utilisation and available capacities. People also had to be visible, meaning others needed to be aware of what they were involved in.</td>
</tr>
<tr>
<td>Trust</td>
<td>Trust was an important aspect of collaboration as many people did not have visibility of the whole process and they had to trust others who were enacting the process or its parts and made the decisions.</td>
</tr>
<tr>
<td>Variety</td>
<td>A variety of rules presented an opportunity to create the best possible business structure.</td>
</tr>
<tr>
<td>Visual Guidance</td>
<td>As people absorbed visual information better, flow charts of new processes were created for easy learning and reference.</td>
</tr>
</tbody>
</table>
5.3.3.2 Horizon of Experience for C11

Working as a laboratory employee, C11 was focused on her job satisfaction. She complained about organisational changes that: limited interaction with others, restricted training, made processes non-challenging and mundane, and introduced division of labour which confused employees and alienated customers. The ultimate process effectiveness and efficiency for C11 could only be achieved when people were satisfied in the workplace as only then they paid attention to what they did and did not make unnecessary mistakes. In Table 5.6 C11’s horizons of experience for business process enactment are shown. This consists of 24 common codes and the relevant context.

Table 5.6: Horizon of experience for C11.

<table>
<thead>
<tr>
<th>COMMON CODES</th>
<th>CONTEXT (MEDICAL SCIENCE, LARGE CORPORATION)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automation</td>
<td>New instruments automated some processes as the tests could be performed quicker and with less human involvement. While this made processes more effective and efficient, employees became unclear about their future employment with the organisation.</td>
</tr>
<tr>
<td>Challenge</td>
<td>Challenging work motivated people and made them proud so they took responsibility for and ownership of the job.</td>
</tr>
<tr>
<td>Changes</td>
<td>Many changes happened in the business and while the company’s profit increased the employees’ situation worsened.</td>
</tr>
<tr>
<td>Collaboration</td>
<td>The company’s growth in recent times through acquisitions increased collaboration between employees but at the cost of their motivation (now tests are designed by others and microbiologists work only on performing them which is monotonous and non-challenging).</td>
</tr>
<tr>
<td>Communication</td>
<td>Communication facilitates good collaboration but with the increased size of the organisation it is difficult to determine who is responsible for what and who to talk to in case of problems.</td>
</tr>
<tr>
<td>Compliance</td>
<td>While safety regulations are rigidly followed some other rules are bypassed. With the merger of the business new methods were created and according to the guidelines all employees should be trained in them. However, no training was provided and when the National Australian Testing Authority was coming for an audit all employees were asked by the managers to sign the document to say that they received the training.</td>
</tr>
<tr>
<td>Customer Service</td>
<td>Customer service was important and was the reason behind reversing some business changes. For example, microbiologists were isolated from customers to concentrate on their work and be more efficient but after customer complaints that unknowledgeable administration staff could not answer the questions the decision was reversed.</td>
</tr>
<tr>
<td>COMMON CODES</td>
<td>CONTEXT (MEDICAL SCIENCE, LARGE CORPORATION)</td>
</tr>
<tr>
<td>-------------</td>
<td>---------------------------------------------</td>
</tr>
<tr>
<td>Effectiveness</td>
<td>Effectiveness was decreased when people did monotonous work and just followed the instructions instead of coming up with the solutions as they lost concentration and made mistakes. Technology brought improvement in effectiveness of work as machines did not make mistakes.</td>
</tr>
<tr>
<td>Efficiency</td>
<td>New instruments improved process efficiency as the tests could be performed quicker and with less human involvement which most likely will lead to dismissal of some employees in the future. Some technology solutions however made work very inefficient. For example, a new information system for preparing laboratory reports was unsuitable for a pharmaceutical lab and reports now take twice as long to prepare.</td>
</tr>
<tr>
<td>Experience</td>
<td>Due to the specialised services provided, the knowledge was required but the practical experience was more important. For example, people with PhDs had problems with doing simple practical experiments.</td>
</tr>
<tr>
<td>Human Errors</td>
<td>When people did monotonous work and just followed the instructions instead of coming up with solutions to problems, they lost concentration and made mistakes which decreased the effectiveness of their work.</td>
</tr>
<tr>
<td>Information</td>
<td>Information stored in the system could be accessed only very slowly as all world locations logged into the same database. Frequent delays and frozen screens frustrated the employees.</td>
</tr>
<tr>
<td>Instruments</td>
<td>Sometimes introducing new instruments into the process was quite cumbersome as in a transitional period they had to be run alongside old instruments and the results compared. New instruments improved process efficiency as the tests could be performed quicker and with less human involvement which most likely will lead to the dismissal of some employees.</td>
</tr>
<tr>
<td>Interactions</td>
<td>People’s interactions are the most important as without them work is monotonous and people are not motivated. Additionally interactions with others allow transfer of the required knowledge. In the past social events were organised so people could feel part of the team and work better.</td>
</tr>
<tr>
<td>Knowledge</td>
<td>Knowledge was required to do laboratory work and the majority of lab workers finished university. However science and technology continuously advanced so training had to be up to date all the time.</td>
</tr>
<tr>
<td>Language</td>
<td>While language is important, customers preferred knowledgeable and less proficient microbiologists over fluent but inexperienced administration staff.</td>
</tr>
<tr>
<td>Learning</td>
<td>Skills development in the form of training should be provided as it gives skills and motivates people to perform their job better. Additionally science and technology continuously advances so you need to be up to date. Training is a long term process and it should be pursued even if it is costly as in the end it will make people work better. The best way was to observe how things were done by others and try yourself.</td>
</tr>
<tr>
<td>Management</td>
<td>Employees should be able to determine which manager is responsible for what area and who can help to deal with specific problems. Managers should not pressure employees to break the law.</td>
</tr>
<tr>
<td>COMMON CODES</td>
<td>CONTEXT (MEDICAL SCIENCE, LARGE CORPORATION)</td>
</tr>
<tr>
<td>--------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Motivation</td>
<td>While the financial rewards were a motivational tool, the more relevant was to ensure that people had challenge in their work. Additionally contact with people (customers or colleagues) made you happier and motivated you to work better. Finally opportunities for skills improvement in the form of training motivated people but currently they were not provided.</td>
</tr>
<tr>
<td>Ownership</td>
<td>Challenging work made people proud and they took responsibility and ownership of the job.</td>
</tr>
<tr>
<td>Physical Layout</td>
<td>Air pressure instruments isolated from other parts of the workplace were required to ensure employees safety.</td>
</tr>
<tr>
<td>Power</td>
<td>There were cases of management abusing their powers and forcing employees to sign untrue statements about receiving training.</td>
</tr>
<tr>
<td>Process Bypassing</td>
<td>Employees were asked by management to bypass the proper process when new methods were created with the merger of the business. They did not receive the training but were asked to sign a document to the contrary. It was an annoying experience but as the idea came from upper management there was not much they could do.</td>
</tr>
<tr>
<td>Safety</td>
<td>Employees dealt with chemical substances and their safety was a big concern. The company had a strict safety policy and safety coordinator was in regular contact with all laboratory employees.</td>
</tr>
<tr>
<td>Satisfaction</td>
<td>The best satisfaction people had was when the work was not monotonous and they had facilities to relax, like a common room or TV.</td>
</tr>
<tr>
<td>Technology</td>
<td>New technology was being introduced all the time so the knowledge had to be kept up to date. Some technological advances were quite complex and introducing new instruments into the process was quite cumbersome.</td>
</tr>
<tr>
<td>Visual Guidance</td>
<td>The best way to learn and know how to do things was to observe how others did them and try yourself.</td>
</tr>
</tbody>
</table>

### 5.3.4 Clustering Codes into Themes

Horizons of experience of different co-researchers helped me to recognise the common codes that overlapped or were closely related. This enabled me to cluster codes into themes (see Table 5.7). In-depth knowledge of co-researchers’ stories assisted in identifying themes related to different elements of the activity system and the manifestation of different affordance categories during process enactment. The themes were built by looking at the specific codes and determining which element of a previously created framework (section 2.5) they were linked to.

Many co-researchers discussed the importance of people understanding what to do within the process, which was influenced by people’s knowledge, experience and
capabilities. Understanding could be improved through learning, visual guidance and people being involved in process design. Lack of such understanding on the other hand led to human errors and process bypassing. The activity system *subject* has to be aware of what can be done and how it can be done within a process. Codes that clearly related to such awareness were clustered into the **human capabilities** theme. An important note is that the specific codes did not necessarily mean capabilities but were closely related to how capable people were to enact the processes. For example, human errors are not capabilities but are the result of human capabilities. For that reason a human errors code was included in the human capabilities theme (see Table 5.7).

Another theme related to the *subject* of the process activity system emerging in co-researchers’ experiences was **human motivation**. While people could enact processes, their full attention was only given when they were satisfied and had appropriate challenges matching their personal goals. Again, the specific codes did not necessarily mean motivation but were closely related to how motivated people were when they enacted the processes.

As processes often involved multiple individuals, co-researchers often discussed interactions between different process stakeholders (enactors, vendors, customers or owners). In some cases such dealings took the form of meetings while in others communication happened through technological solutions such as email or a teleconference system. Contacts with others were important as they built trust and improved collaboration. These codes clearly related to the relationships between members of the process activity system *community* and were clustered into a **human interactions** theme.

Some co-researchers stressed the importance of the culture and language of people involved in process enactment. Such codes were clearly related to the shared values embraced by the process activity system *community* and were clustered into **human culture**.
For many co-researchers, resources used within the process (equipment, materials, technology, systems, or information) were necessary to produce the required output. Spatial arrangements of such resources could affect the processes and the physical layout of the workplace should be carefully planned. Additionally, in the competitive business market, technological advances had the potential to improve process efficiency, and instrument changes were frequently implemented. Such codes were clearly related to the process activity system *instruments* and were clustered into the process inputs theme.

For many co-researchers reasonable, clear and uniform regulations made it much easier for the process subject to comply with such rules. For some, specific legislation related to safety or security also had some importance. Such codes were evidently related to process activity system rules and were clustered into process rules.

Multiple people enacting the processes could be involved in different process parts and it was important to coordinate all efforts towards the common process objective. Management was often involved in process planning involving the assignment of particular tasks, and monitoring relating to the measurement and evaluation of how well the processes are performed. It was often important to ensure that people took ownership for tasks that were assigned to them. Different power structures relating to how people interacted with each other, and different responsibilities within the process, resulted in an inherent conflict between some process stakeholders. For example, product designers required great flexibility while manufacturers needed great rigidity. The departmental manager aimed at maximising process efficiency while a director was happy to sacrifice such efficiency if the business ROI increased through significant tax savings. Such codes were related to process activity system division of effort and were clustered into process division of labour.

The remaining codes, such as transparency, automation, integration, reliability, flexibility, rigidity, and mobility, related to characteristics reported as meaningful to different co-researchers and were grouped into the process attributes theme. While other themes could be mapped to the specific elements of the process activity system, the attributes represented the properties of the whole process and were the
effect of other themes. For example, automation and integration resulted from the use of specific process inputs, for example information systems. Table 5.7 presents the established themes.

Table 5.7: 51 Common codes and themes identified in the co-researchers life experience.

<table>
<thead>
<tr>
<th>THEMES</th>
<th>CODES</th>
<th>NO OF CODES</th>
</tr>
</thead>
<tbody>
<tr>
<td>HUMAN CAPABILITIES</td>
<td>Capabilities Experience</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Human Errors People</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Process Involvement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bypassing Visual Guidance</td>
<td></td>
</tr>
<tr>
<td>HUMAN MOTIVATION</td>
<td>Challenge Motivation</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Satisfaction</td>
<td></td>
</tr>
<tr>
<td>HUMAN INTERACTIONS</td>
<td>Collaboration Communication</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Meetings Trust Interactions</td>
<td></td>
</tr>
<tr>
<td>HUMAN CULTURE</td>
<td>Culture Language</td>
<td>2</td>
</tr>
<tr>
<td>PROCESS INPUTS</td>
<td>Changes Physical Layout</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Information Instruments</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Documentation Technology</td>
<td></td>
</tr>
<tr>
<td>PROCESS RULES</td>
<td>Compliance Reasonableness</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Clarity Safety</td>
<td></td>
</tr>
<tr>
<td>PROCESS DOL</td>
<td>Management Ownership</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Planning Power</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Monitoring Stakeholders’ Conflict</td>
<td></td>
</tr>
<tr>
<td>PROCESS ATTRIBUTES</td>
<td>Effectiveness Efficiency</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Quality Best Structure</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Automation Integration</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Standardisation Universality</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rigidity Reliability</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Customer Service Transparency</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Easiness Flexibility</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Easiness Flexibility</td>
<td></td>
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<tr>
<td></td>
<td>Easiness Flexibility</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Easiness Flexibility</td>
<td></td>
</tr>
</tbody>
</table>

5.3.5 Composite Textural Description

Individual textural descriptions illustrated in detail the experiences of specific co-researchers. For the sake of brevity, only the two narratives were presented. While some codes and themes appeared in the examples provided, others were present only in the analysis of the experiences of other interviewees. For example, physical layout was not discussed by C3 and C11 but it was clearly visible in the interviews of the other eight co-researchers. The purpose of this sub-chapter was to create a composite textural description of co-researchers’ experiences of process enactment. The section is intentionally long to ensure that all topics that emerged during the interviews are included in the discussion.
Working with 16 individual textural descriptions I created Table 5.8 which lists themes and common codes. To provide an indication of the extent to which the issues were shared between the co-researchers, the columns for number and percentage of participants experiencing them were added. Total common codes and themes relevant to each co-researcher were inserted at the end of the table. The table allowed me to see at a glance which common codes were the most popular among the interviewees and how the specific themes were distributed. It was clear that knowledge, learning, motivation, collaboration, changes, technology and efficiency had relevance to all co-researchers in their business process enactment experiences. It was further noticed that for most co-researchers the majority of codes from human capabilities, motivation, interactions, culture, and process inputs were relevant; half of the codes from rules and the division of labour theme were important; and only one third of codes from process attributes were of some significance. Some common codes such as best structure, trust, universality, mobility and security were only marginally mentioned. Finally, the co-researcher discussing the most common codes and themes was C3 (36 codes and 8 themes) and C16/C13 discussed the least (22 codes and 8 themes / 25 codes and 7 themes).
<table>
<thead>
<tr>
<th>THEMES</th>
<th>COMMON CODES</th>
<th>C1 Den tist</th>
<th>C2 ERP Consul tant</th>
<th>C3 IT Direc tor</th>
<th>C4 Beaut ician</th>
<th>C5 Fleet Mana ger</th>
<th>C6 IT Mana ger</th>
<th>C7 Bakery Mana ger</th>
<th>C8 Non-Profit Mana ger</th>
<th>C9 Timber Sales man</th>
<th>C10 Product Desig ner</th>
<th>C11 Microbi ologist</th>
<th>C12 Electr ician</th>
<th>C13 Sales Engi neer</th>
<th>C14 Mach inist</th>
<th>C15 Tea cher</th>
<th>C16 Accou ntant</th>
<th>CO-RESEARCHERS</th>
<th>NUM BER</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>HUMAN CAPABILITIES</td>
<td>Capabilities</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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Table 5.8 guided me to specific instances of lived experiences which facilitated the preparation of a composite textural description. This composite narrative is presented in the next section. It is structured by themes and within them affordances are clearly highlighted.

### 5.3.5.1 Human Capabilities Theme

Phenomena represented by common codes from the human capabilities theme (see Table 5.9) include knowledge and learning which had significance for all co-researchers and experience and process bypassing which were important for the majority of co-researchers. Human errors impacted half of the co-researchers while people involvement in process design, visual guidance in learning and people capabilities had significance for a minority of co-researchers.

**Table 5.9: Eight common codes from Human Capabilities theme identified in business process enactment experiences of all co-researchers.**

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<th>THEMES</th>
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<th>C3</th>
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The interaction between human capabilities and the properties of the business process has the potential to contribute to the emergence of different categories of action opportunities. These affordances included cognitive, emotional, motivational, social, physical and functional action opportunities and are detailed next.
5.3.5.1.1 Cognitive Affordances

The study showed that knowledge and experience are vital aspects of business process enactment as they make people aware of what to do and how to do it. They facilitated, therefore, the emergence of cognitive affordances. For example, in the shipping industry, the financial success of a voyage was related to the knowledge of the ship operator.

Lack of knowledge could lead to many undesirable effects, such as poor product quality (C7), bad customer service (C11), human errors (C4, C8, C11), process bypassing (C2), and poor collaboration (C1, C4, C8). For example, in a bakery, the quality of the bread improved when more qualified bakers were employed (C7). Customers of a pharmaceutical laboratory were leaving as the administrative staff they dealt with was not knowledgeable enough (C11). Linesman electricians fixing a fault were electrocuted (C12). Employees of a regional council bypassed the purchase approval system (C2). A beautician preferred to work alone as hairdressers regularly double-booked her (C4). In other words, without specialised knowledge the processes either could not be performed at all or they could only be performed ineffectively or inefficiently:

“I employed some people who were more qualified than myself and they thought they could do it better, and they did it better. They found a better way than my system (...) so the quality that they delivered was higher than my own.” [C7 19]

“The clients wanted the contact with you, with the person who does the testing, the analysis. They wanted to talk to the person who really knew.” [C11 10]

“There were quite a few fatalities through the 80s and 90s in our industry throughout the State, through people doing the wrong thing.” [C12 12]

The importance of knowledge and its contribution to the emergence of cognitive affordances was reflected in all co-researchers’ attitudes towards learning, discussed
as another vital aspect of processes. Some learning was a result of formal education (trade school for an electrician, technical college for a machinist or university degree for a teacher), while other learning happened informally in the workplace (apprenticeship for a beautician and electrician or years of practice for a security manager, timber salesman and machinist). For some co-researchers learning by experience was superior to other forms of gaining knowledge. For example, a microbiologist identified practical experience as more important than theoretical knowledge (C11), and for an accountant years of experience provided her with the tacit knowledge that could never be obtained otherwise (C16):

"She was a doctor and [had] all of these degrees but she didn't actually have real experience how to do the basic things. So she was like three weeks and we had to dismiss her because she was not useful to us (...). For me the experience is the main thing.” [C11 20]

Another way to gain the knowledge required for the business process enactment was training. According to a product designer training was the most important aspect of the process enactment as it ensured the project’s success:

“"The most important thing was around recruiting and training people.” [C10 136]

Interestingly, there were cases where subjects’ knowledge could not be improved even through training due to limited capabilities (C2). For example, an ERP consultant had to design many processes for the regional public sector customers differently, as the employees’ capacities were often low. This was caused by the lack of exposure to complex information systems and difficulties with the retention of good employees

“We have to consider not only the basic process or so, introducing the best of the best process, but we also have to take into consideration is the organisation or the people who are going to adopt this process capable enough?” [C2 118]
To ensure that people had the relevant capabilities and knowledge required for the processes, people involvement in process design or improvement was advocated. For example, for a product designer, the manufacturers had to be involved in the product design. For a sales engineer, any process improvements should be done in cooperation with employees who enact such processes (C13). For an accountant, the involvement of end users ensured that their knowledge of the business is utilised and they understand future processes (C16):

“If you can engage that person to begin with, feeling empowered and they are part of the process which is a better process for them in the end, I think you will have a better outcome. But also a better understanding of (...) what is actually happening at the coalface as opposed to what some of these designers of processes perceive is happening.” [C16 129]

According to some co-researchers, the easiest way to learn was through visual guidance. For example, customers of an ERP consultancy firm preferred visual demonstration on how to use the systems over the written manuals (C2). Beautician apprentices learned by watching others and baker apprentices referred to visual charts describing the process details (C4). The bakery manager prepared visual charts for apprentices to follow during the baking process (C7). Visual guidance often related to perception affordances as it made process enactment easier to understand and follow:

“They want to visually see and get demonstrated, or someone to guide them.” [C2 122]

“It all comes with the training (...) They do teach you this (...) apprentice work, it’s a ‘monkey see, monkey do’, like you just watch and whatever they do, that’s how you learn, you just watch and learn.” [C4 225]
5.3.5.1.2 Emotional Affordances

Human errors could lead to frustration for others affected by them. There was a clear relationship between such errors and emotional process affordances. For example, a beautician was angry with others making mistakes in scheduling her appointments (C4). A manager of a not-for-profit organisation was annoyed when she had to waste a lot of time looking for details of the lease bond paid as the previous accountant recorded it erroneously under expenses (C8):

“Competency is important as it makes job of all the others involved, at the time or even in the long future, much easier so they do not waste lot of time unnecessarily, like I did.” [C8 221]

Lack of knowledge, often resulting from lack of opportunities to learn how to enact the processes, was another factor with the potential to contribute to emotional process affordances. People became frustrated when their training was neglected and they did not get any support from their organisation. For example, an ERP consultant was annoyed that management did not spend enough on training (C2). A sales engineer was happy when the company sent him on a course (C13):

“I'm happy with that course because it is an interdisciplinary course.” [C13 51]

5.3.5.1.3 Motivational Affordances

Learning and training could also influence employee motivation and is closely associated with motivational affordances. For example, a sales engineer was motivated to work better when the company sent him on a university course (C13); a microbiologist was demotivated when the company, after restructuring, stopped offering employee training (C11):

“Some people need to keep knowledge and learning (...) and in this company at the moment it's nothing. Like no one has been in training, like a proper
Another way the organisations motivated people was their involvement in the process design. Whether it was a large-scale redesign or a small process adjustment, it strengthened people’s feeling of affiliation with the business and increased their ownership of the process tasks:

“There’s some things that I do process wise, where they’ve gone, ‘I like that idea. We’re going to scrap that way of doing how we do that and we’ll do it your way (…). That gave me a bit of motivation.” [C4 249-251]

5.3.5.1.4 Social Affordances

Lack of knowledge had the potential to constrain the emergence of social affordances of business processes. Human errors strained interactions between process subjects while poor product quality and bad customer service introduced tension in the relationships between process subjects and customers. While a lack of knowledge constrained interactional affordances the presence of knowledge facilitated the emergence of such affordances. For example, in a dental practice a receptionist was preparing purchase orders to be approved by a dentist (C1). As she used to be a dental nurse she was familiar with all the instruments and supplies and it made the dentist’s work much easier. In a global IT organisation, the knowledge had to be continuously shared and extensive documentation of that knowledge allowed employees in other parts of the globe to deal with issues when they arose (C6):

“With the organisation growing and hiring new people there was an urgent need to develop certain standards so the new hires could join in the team and become productive very quickly (…) So we had to create documents that would cover almost every aspect of work (…) So when something happens in one time
Social affordances include also cultural action opportunities relating to people sharing common understanding about the world around them. One aspect of such understanding in modern western societies relates to people occupational health and safety. Lack of knowledge could result in serious harm to the process stakeholders and consequently constraint the emergence of such cultural affordances. For example, linesman electricians fixing faults could be electrocuted (C12), or customers of the beauty salon could get a nail infection (C4):

“They're cutting the cuticles to the point they're bleeding in the process (...) there's always antibacterial agents that you can apply straight away that do avoid infection but people out there aren't doing this and that's what's caused nail infections and destroyed cuticles.” [C4 36]

To ensure that people are safe, over recent years the authorities introduced many work safety regulations, such as a ban on cutting cuticles in Victoria. Another type of regulation introduced in the community to ensure that the necessary level of knowledge and skills is maintained and the public are not exposed to costly errors, related to the requirements for training. Some professions, such as dentists, teachers and accountants were obliged to undertake mandatory professional development:

“Each teacher has to do – I think it is 100 hours of professional development over a five year period.” [C15 81]

Cultural affordances of processes could in some cases constrain process subjects’ capabilities (C3). For example, a financial controller in a global manufacturing organisation had high capabilities that he could use in the US but not in Japan where culture did not allow him to make any decisions:
“With a lot of these things, it's not necessarily the capability of the person, but the culture around it, that can have an impact on processes.” [C3 166]

5.3.5.1.5 Physical and Functional Affordances

Learning can be facilitated or constrained by the specific arrangements of the workplace linked to physical layout affordances. For example, in a school an accountant worked in an enclosed space (C16) and in a global IT organisation people worked in an open space (C6):

“The open space – we love it and we love it for – it’s mainly collaboration and learning. Sitting close to each other and listening to people’s conversation allows new employees or even people who sort of work on something else to learn by osmosis and it works very well.” [C6 96]

Learning could also be enhanced by instruments enabling the exchange of information and knowledge and linked to functional affordances. For example, in a bakery, apprentices learnt from flowcharts (C7):

“I started to make up a chart so that when somebody else who was not myself would get on the ovens, they would look at it and say “Okay, well C7 bakes her white cobbs at 240 degrees for 17 minutes and she’s steamed them for three seconds. If I follow that same process, my product is going to look the same as C7’s.” [C7 16]

Lack of training, and as a result lack of knowledge, could be the reason behind people bypassing the processes which in turn related to functional affordances. While processes were designed with a specific function in mind, subjects were simply unaware of how to follow the process to achieve the function. For example, in a global IT organisation, the relevant employees were not advised about process changes and violated it (C6). Customers of an ERP consultancy firm rejected the purchase approval process due to the lack of knowledge (C2):
“It’s not that the systems are bad or the processes are bad (...). Once we go live, they say the system doesn’t work. But it’s not the system but it’s you who doesn’t know how to run it.” [C2 123]

People have to have the required knowledge about how to use some instruments, to facilitate manipulation and functional affordances. For example, a machinist knew how to open a specialised toolbox and how to use precision machinery to cut the metal parts (C14).

At the same time functional affordances of processes had the potential to enhance human capabilities through enabling learning.

5.3.5.1.6 Summary

The human capabilities theme was discussed by all co-researchers. Knowledge was clearly visible in all interviews, suggesting the importance of this aspect in many working environments and on many organisational levels. This may not be so surprising considering how specialised many positions are today and how often they require the use of complex instruments or procedures. Closely related was learning which allowed people to gain the knowledge required to perform the processes. People involvement and visual guidance could facilitate learning which in turn together with people capabilities and experience had the potential to improve knowledge. Lack of knowledge led to human errors and process bypassing which in turn caused ineffectiveness, inefficiencies, bad quality, inadequate customer service, poor collaboration, and low motivation. As a result business performance suffered and ultimately financial results could be impacted.

There was a clear relationship in co-researchers interview transcripts between phenomena represented by codes from the human capabilities theme and the manifestation of psychological, social, functional and physical affordances as presented in Figure 5.1. The arrows represent perceived relationships.
5.3.5.2 Human Motivation Theme

Table 5.10 shows the phenomena represented by common codes from the human motivation theme. These include motivation which had significance for all co-researchers and satisfaction which was important for the majority of co-researchers. A minority stressed that challenge was also an important factor in motivating them to work.

Affordances may emerge from the interaction between human motivation and the properties of the business process. These affordances include cognitive, emotional, motivational, social, physical, and functional and are detailed next.

Table 5.10: Three common codes from Human Motivation theme identified in business process enactment experiences of all co-researchers.
5.3.5.2.1 Cognitive Affordances

The study shows that motivational factors which facilitated the emergence of cognitive process affordances related to learning and career progress. For example, a pharmaceutical laboratory stopped offering training to the employees and as a result staff became disconnected (C11). A sales engineer was very happy with the company sending him on the course that increased his skills and helped him to work better (C13). A global manufacturing corporation supported skills development and offered long-term career opportunities (C3):

“So we actually have training going underway each week now to be able to provide her the skills to allow her to progress from those positions up into these positions. So we have things like that for every person in the team.” [C3 239]

5.3.5.2.2 Emotional Affordances

Motivation and satisfaction contributed to the emergence of emotional affordances. For example, a microbiologist was happy and motivated to work when she had a chance to interact with other people in the processes (C11). An ERP consultant was frustrated when the management disregarded his suggestions and as a result one of the projects was really struggling (C2):

“Motivation factors were really low. Because even though the people raised alarms that this was supposed to happen, it was not happening (...). So that frustrated the whole team. The team motivation runs very, very low.” [C2 201]

People were frustrated when organisations did not provided them with the facilities required to do the job. For example, in a global IT organisation employees’ happiness index dropped when working space and parking became limited.
“People (...) are unhappy. And the lack of space problems, parking, and all this sort of trivial facilities issues really impact on people’s enjoyment, job satisfaction and it shows.” [C6 97]

5.3.5.2.3 Motivational Affordances

For all co-researchers, motivation, closely related to motivational affordances, was a vital aspect of business process enactment. For example, only motivated people could ensure that processes are followed (C3 – IT director), performed efficiently (C11 – a microbiologist), and are enacted successfully (C2 – ERP consultant):

“You can introduce best of the best processes if the people are not motivated or people are not along with the processes you won’t succeed.” [C2 211]

People motivation widely varied and it was the management’s role to find what works for whom. For example, a shipping fleet manager assigned work to his employees according to every individual’s preferences.

“Everybody’s motivated in different ways, and understanding those key drivers for each of your team, is one way of getting the best out of that team. Some people like public praise, other people will shy away from it, some are only motivated by money, which we all are. So by understanding what the key drivers of your team are, you can sometimes get more out of them. (...) So you would just cater for their workload according to the individuals.” [C5 96]

Financial reward for the job was the most common way to motivate employees. For example, a beautician was taking extra-long shifts in her part-time waitress job (C4) and an electrician was working overtime (C12) to earn more money. Some employees of a not-for-profit organisation worked only for money (C8). A bakery manager motivated her young staff with cash prizes or vouchers (C7). An electrical company rewarded employees with small incentives (e.g. cinema tickets) when customers called the office with positive feedback on their work (C12):
“Someone’s got to do it. I’d prefer not to be doing it, but it’s the overtime and the money as well that helps you get through it.” [C12 125]

“To motivate my staff, I use incentives. A lot of my staff is actually still studying (...) so to them, job satisfaction isn’t as important as it is to me. So they respond more to vouchers and to cash prizes.” [C7 42]

While financial reward was important, other factors were more satisfying. For example, for a bakery manager (C7), product designer (C10) and microbiologist (C11) challenge was the main driver:

“I wouldn’t say no to money, my whole life, I’ve always found that I personally respond better to, and feel more motivated by more challenge.” [C7 40]

“Well, financially it’s better. It’s a big company, they pay you well but I would say it’s not challenging anymore for me.” [C11 87]

According to a machinist, human goals often depended on their age, and fulfilment of those goals brought people satisfaction which contributed to the emergence of motivational affordances of processes. Young people preferred to have challenge and skills improvement and often looked for work in bigger organisations. Middle-aged people had knowledge and experience and were interested in higher financial rewards, even at the cost of job stability, so preferred smaller organisations. Older people did not want to push themselves and work long hours and opted for job stability in bigger organisations.

Listening to people and implementing their suggestions also facilitated the emergence of motivational affordances. For example, in a salon some processes were adjusted when the boss realised that a beautician’s way of doing things was better (C4). In a manufacturing business there was a suggestions box, but employees did not use it as they never received any feedback or incentive and did not consider any effort worthwhile (C14). In an electrical company, employees could regularly suggest improvements (C12):
“A meeting that we have to go to where we put forward ideas that could make the business better, where they ask the workers what you could do (...) And I think there’s been a few changes to come in, and a lot of them are small changes, but they do make things better.” [C12 162]

In a global IT organisation a performance review system was introduced to motivate people, but for the majority it achieved the opposite result. Many employees were ranked as low performers even though they were extremely good workers and this demotivated them:

“The performance review originally was designed to keep the development of the company on the edge and losing the last five or ten per cent people every year so that would create some competition and passion.” [C6 12]

“The system works in some situations but doesn’t work in others (...) It doesn’t make sense when the teams are quite steady, there are not many people leaving and not many people coming, after a few years the bad guys are already gone so then the teams start beating good people out because someone has to be in four, five. So, in those situations the system doesn’t work and it’s completely unfair.” [C6 18]

5.3.5.2.4 Social Affordances

Relationship with people, related to social interactional affordances, brought satisfaction to process subjects. For example, a timber salesman preferred working in a small family-owned company because people were closer and he felt more appreciated (C9). For a microbiologist, interacting with people made her happier and work better (C11). For an accountant, the big corporate world tended to be more impersonal and a small local school with more personal relationships was more motivating (C16).

“The school environment is local to the community is local to where I live so there’s much more satisfaction in the relationships that I make there because
they are notable outside of that school environment as well. So that brings with itself a great satisfaction, a permanency about it that it’s not just a job, it’s also a part of my lifestyle.” [C16 78]

Many people share a need to help less fortunate members of society or to advance civilisation by making discoveries or designing solutions to specific problems. Doing something that was useful for others brought therefore a lot of satisfaction to process subjects. At the same time it also facilitated the emergence of social interactional and cultural affordances. For example, employees in a not-for-profit organisation helped older people (C8). Staff in a product designer company worked on medical products that aided sick people (C10). A teacher helped kids to develop (C15). An electrician fixed power in the house (C12):

“I (…) joy out of it, getting the power back on after a big storm and people who have been off supply for 10, 12, 24 hours or whatever, and we do our bit.” [C12 54]

Employees were also motivated by social events organised with the workplace people. These social events facilitated interactional affordances. For example, a product design consultancy firm provided sports facilities to support people doing things together outside work (C10), and a sales company organised occasional lunches (C13). Interestingly, in big organisations management efforts were not always successful. For example, a global IT organisation provided a morale budget but people often did not attend organised events (C6). In accountancy firms, social events organised by management were perceived as a forced issue and staff-driven events were preferred (C16).

“Generally speaking when it comes from the management it doesn’t work (…) I do think management becoming involved in something that the staff are doing works better than management organising these things and staff generally taking a very cynical view of it (…) The management promote these
things but the staff are non-accepting of it, it’s very interesting, it almost backfires I think.” [C16 170-174]

5.3.5.2.5 Physical and Functional Affordances

People were better motivated when organisations provided them with facilities required to do the job, including properly working instruments. These are related to physical and functional process affordances. For example, in a global IT organisation employees were demotivated by the lack of space and parking but at the same time they were happy and motivated by working in the open space (C6). In the school on the other hand, teachers were motivated when all the teaching aids were readily available (C15).

“Making available everything possible to make the job easy for teachers (...) for example, if we need anything to help us prepare our lessons to use in the classroom, we’ll just go into the stationery room, take what we need, write it down and there’s no hassle (...) you go any time, so just making everything available that they possibly can make available, I think is helpful and they do that well at this school.” [C15 95]

Motivated people were more concentrated on their work and more likely to use the instruments properly and less inclined to bypass the processes (C1, C2, C3, C4, C5, C6, C7, C8, C9, C10, C11, C12, C13, C14, C15, C16), which in turn related to functional affordances. Processes were designed with a specific function in mind and motivated subjects were more likely to follow the process to achieve this function.

5.3.5.2.6 Summary

Motivation was clearly visible in all interviews, suggesting the importance of this aspect in many business processes. While co-researchers at the higher level of an organisation were interested in ensuring process success (C3), at the lower level they were more inclined to be interested in their own benefit, for example financial
rewards (C7), career progression (C2) or job satisfaction (C11). Motivation was considered by all as important, and in some cases crucial in business process enactment. Satisfaction had significance for the majority of co-researchers and challenge to some of them. People who were motivated, satisfied and challenged were more inclined to do what was good for the business as the organisation’s gain was also their own. They were proud of their job and took responsibility and ownership for it. As a result they performed the processes more effectively and efficiently, provided good quality work and good customer service and were more inclined towards collaboration.

There was a clear relationship in co-researchers’ experiences between phenomena represented by codes from the human motivation theme and manifestation of psychological, social, functional and physical affordances. This is shown in Figure 5.2 where arrows represent perceived relationships.

![Figure 5.2: Perceived relationships between phenomena represented by common codes from Human Motivation theme and manifestation of affordances.](image)

5.3.5.3 Human Interactions Theme

The common codes that represent phenomena from the human interactions theme (see Table 5.11) include collaboration which had significance to all co-researchers and interactions, communication and meetings which were important for the majority of co-researchers. A minority pointed to trust as an important factor influencing interactions with others during process enactment.
The interrelationship between human interactions and the properties of the business process has the potential to contribute to the emergence of different categories of affordances. These affordances include cognitive, emotional, motivational, social, physical, and functional and are detailed next.

Table 5.11: Five common codes from Human Interactions theme identified in business process enactment experiences of all co-researchers.

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5.3.5.3.1 Cognitive Affordances

Collaboration through the exchange of information and knowledge facilitated the emergence of cognitive affordances. For example, an IT security manager was responsible for a process running 24 hours a day. His team had to pass information to the next team so they could take over without disrupting service (C6). A microbiologist explained how to handle tested products to other process subjects (C11).

“I do my part, I take my time and I talk to them and I try to explain (...) If it is water you always have to keep it cold because you don’t want the bacteria to grow.' Or, 'If food don’t put it out for a little bit, we want it straight away going in the fridge'. You take the time to explain because if you don’t people just don’t understand what they are doing and they just follow instructions without knowing why they are doing, so then they make a mistake, they make a mistake, they make a mistake.” [C11 137]

Interactions facilitated good communication and through that cognitive affordances. In an ERP consultancy firm communication was required to pass information between
multiple parties involved in the processes (C2). In a timber-selling organisation salespeople were in constant communication to pass information on about the product and prices (C9):

“You’re always talking to your sales manager to find out what’s coming through, what products we’ve got to sell off, or if we’re going to be short-supplied.” [C9 69]

Collaboration became easier when people knew each other and were aware of what works for them and what does not:

“[My main nurse] was nursing with the old dentist so she didn’t know me and now she knows the way I like to work. So she prepares my instruments. Sometimes I don’t need to tell her and she just passes instruments to my hand.” [C1 300]

Getting to know others could be achieved through informal interactions. For example, a global IT corporation sent their researchers regularly to remote labs so they could bond better with employees from other countries and work stronger as a team (C6). A product designer could obtain more information by visiting the customer than through formal teleconference meetings (C10). A microbiologist wanted to have friendships at work where she spent most of her day time (C11):

“I find that it’s something important for people to be not just work, work, and work. It’s good to have a little bit of relationship and friendship for them. That makes people more comfortable in the place and happier. And if you are not happy you will not do proper work.” [C11 143-145]

5.3.5.3.2 Emotional and Motivational Affordances

Close interactions between workers had the potential to facilitate the emergence of emotional and motivational affordances. For example, a timber salesman felt
motivated when the boss appreciated his son’s work (C9). For a microbiologist, interactions with people made her happier and better motivated (C11). For a beautician, it could however work the other way when employees being close friends brought their negative emotions to work (C4):

“That’s a mixed feeling that part. Like with the whole going to work and they’re like a family, sometimes if I already know the night before they’ve had a bad day, it’s not very motivating for me to go to work the next day.” [C4 205]

Interactions with colleagues outside work should also be encouraged. For an IT manager (C6), microbiologist (C11) and accountant (C16) the best way to ensure that collaboration was good was to organise events outside work where people could meet and socialise:

“It broadens again those relationships that you have in your immediate environment, just to see people outside of work hours and see them as a person as opposed to just a harassed employee that’s running in and out of the office every day, and yes perhaps more inclined to work as a team or at least understand from a more personal approach.” [C16 178]

In some cases breaking up collaborating teams led to a loss of motivation. For example, in a pharmaceutical laboratory the processes were changed through the introduction of the division of labour, and as a result employees became specialised in specific tasks only (C11). As a result motivational affordances were constrained.

“We were small (...) you were very isolated working here but you were proud of what you were doing (...) and you tried to do the best. But now when it’s a big company it’s more like a sort of factory (...) because someone has started, then passed to the subculturing area (...) it goes to the confirmation area, and then (...) it goes to the reporting (...) we are supposed to be working very well as a team (...) but I noticed people don’t take pride in what they are doing (...) They don’t take responsibility anymore.” [C11 69 & 75]
5.3.5.3.3 Social Affordances

Collaboration, meaning working together towards common goals, had a potential to affect and be affected by different social affordances. Firstly, people interactions were more difficult when collaboration was poor. For example, an ERP consultant had negative interactions with a programmer who extensively used company time for private purposes (C2). Secondly, cultural action opportunities made collaboration easier. For example, Dutch customers could easily collaborate with Australian product designers who shared transparent decision making culture (C10). The importance of collaboration however differed. For a dentist it was the most important aspect of processes (C1), for a beautician it was not always important (C4) and for a machinist it was not important at all (C14).

“We are individualist in the machine section. It’s just yourself. There are others, there is teamwork but this job is my responsibility and only mine. I don’t work with anybody else. I do my part of the work and I am responsible to do it right way and have the right result.” [C14 156]

Face-to-face meetings also facilitated the emergence of interactional affordances. For example, a product designer met his clients every three months to ensure good collaboration (C10). A global IT corporation sent their researchers regularly to remote labs so they could bond better with employees from other countries and work stronger as a team (C6):

“Sending the senior researchers to a remote lab and spending a week there (...) creates much better atmosphere, friendship, cooperation and actually delivers much better results than sending so many emails.” [C6 51]

Interactional affordances could also be facilitated by good communication. In an ERP consultancy firm communication was required to pass information between multiple parties involved in the processes (C2). In a timber-selling organisation salespeople were in constant communication to pass information on about the product and prices
(C9). For a product designer, communication was the most important aspect of process enactment (C10).

“Communication with our customers is probably the most important factor in success for the project. So although we were engineers and we’re doing highly technical work, I would say about 70 per cent of the factors that influence the success of that project wasn’t the technical work; that was only about 30 per cent. Most of the success was due to communication and a relationship with the customers and with the team.” [C10 38]

While technology could enable many forms of communication, for some the most effective method would always by face-to-face meetings. A global manufacturer and seller organised regular meetings for IT staff scattered around the globe (C3). In a global IT organisation face-to-face meetings created a better working atmosphere (C6). In a product design consultancy firm, regular meetings ensured that designers and customers were aligned in their goals (C10). In an electrical company staff meetings were organised every five weeks to encourage collaboration and ensure that issues were resolved (C12). Finally, in a school, a lack of meetings resulted in a geography teacher not covering the required material for a students’ exam (C15):

“I would find that if I didn’t have a face-to-face meeting either in Australia or in Europe or the US, wherever they were, every three months, you would start to be misaligned in what you were doing.” [C10 52]

For some the important aspect of employee collaboration was trust. In a global manufacturing and sales organisation cooperation was improved by managers trusting employees (C3), while in an ERP consultancy firm it deteriorated when the opposite happened (C2):

“There is a person sitting there to read our cases and emails we sent out. So somebody is paid to do that. So it’s ... it became worse every day. And yeah, it’s a small organisation and used to be fairly transparent. Trust is very important.” [C2 207]
In a global IT organisation the existing performance review system constrained interactional affordances by weakening employees’ cooperation:

“Company values teamwork but at the same time performance review creates competition, so people are supposed to work together and be friends if possible, working together well and investing into one another’s success, they compete for the spot (...) people compete and hide stuff and not necessarily share the good things.” [C6 18]

In some cases culture linked to cultural affordances significantly influenced collaboration. For example, in the Japanese arm of the global manufacturing and sales organisation the employees were more concerned with their boss than the other employees they needed to work with (C3). According to the fleet manager (C5) and product designer (C10), in some cultures teamwork came naturally (Philippines, Netherlands) while in others decisions were taken and passed down without any collaboration (Korea, France).

“There’s no team, they just do their own things (...) Because how Japan sets themselves up is it’s an open room, the managers sit at the end with desks like that and they look at their staff. So it’s very much like a hall and I watch my staff sitting at little desks.” [C3 188]

5.3.5.3.4 Physical and Functional Affordances

Collaboration could be influenced by the physical affordances relating to the spatial arrangements of the workspace (layout affordances). For example, in a global IT organisation the open space layout facilitated teamwork (C6) while in a school an enclosed office of an accountant constrained it (C16):

“The open space – we love it and we love it for the – it’s mainly collaboration and learning.” [C6 96]
In some cases work could not be performed effectively, efficiently or safely without collaboration with others (C1, C2, C6, C7, C8, C10, and C12). For example, in a bakery with large product quantities produced, some subjects were not able to perform the steps within the required time, which suggested a lack of physical manipulation affordances (C7).

“If it’s an 80 kilo dough in the bowl now, I’d look at it and say ‘No, there’s no way I’m going to get this done’ in that 15-minute timeframe where we know that we’ll achieve the best quality, so I’ll then say ‘Right, well Doug, do you mind jumping in and giving me a hand so we can maintain the quality of this dough?’” [C7 17]

Bigger teams tended to have more issues with collaboration. For example, in a sales organisation with a small team, people were happy to help others with their work (C13). In a global IT company a code review process had to be changed as with an increased number of employees changes in the code repository were discarding the work of others (C6):

“The problem started when we were getting more and more researchers and it often occurs that people check changes into the same (...) chunks of code and the same files. This means that accidentally (...) things break.” [C6 81].

In many cases communication facilitating collaboration was enabled through the use of technology (C2, C4, C5, C6, C9, and C10). This in turn facilitated the emergence of functional affordances. At the same time system functionalities could not be fulfilled unless there was cooperation between people. For example, to process a purchase order in an ERP system, users had to collaborate and perform the specific process steps (C2). In a shipping division of a global mining corporation people communicated through the teleconferencing system (C5):

“They built a system of rooms throughout the world (...) very high band width systems so the screen up refreshers are very, very quick and, of course, the
voice communications are very, very quick so you didn’t have much lag or delay. It was far, far more conducive to teamwork meetings, particularly when you were working with teams which are geographically diverse, and it just brought your team closer together.” [C5 60]

There were cases however when the technological solutions failed. For example, in a global IT organisation, the deluge of emails meant people often disregarded them or automatically filed them without reading (C6). In a product design consultancy firm the teleconference system was not working well due to the low bandwidth (C10):

“The problem with teleconference is that it promises that you have a visual eye contact and you see facial features and so on. In actual fact, unless you’ve got a very good conferencing facility you don’t see that, so it creates the illusion of having that communication.” [C10 48]

5.3.5.3.5 Summary

The human interactions theme was discussed by all co-researchers. Collaboration was clearly visible in all interviews which again was not surprising considering the nature of business processes and the common effort required to enact them. By working together people were able to achieve shared goals. Such cooperation was facilitated by communication, meetings, interactions all of which helped process subjects to gain trust and feel part of the team. As a result people performed the processes more effectively and efficiently, provided good quality work and customer service, and were better motivated and more knowledgeable. Interestingly, for some, interactions were the most important aspect of processes as they ensured that people are happier and motivated to work towards the common goal (C11). However, for others interactions were only occasionally important and there could be cases when they disrupted more than helped (C4, C14). Perceived relationships between phenomena represented by common codes from the human interaction theme and different categories of affordances are presented in Figure 5.3.
5.3.5.4 Human Culture Theme

Common codes from the human culture theme include culture and language (see Table 5.12) which had significance for the majority of co-researchers, although for two of them (C1 and C2) they were seemingly not important at all.

Cognitive, emotional, motivational, social, physical, and functional affordances may arise from the interaction between culture and properties of the process. These affordances are detailed next.

Table 5.12: Two common codes from Human Culture theme identified in business process enactment experiences of 13 co-researchers.

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5.3.5.4.1 Cognitive Affordances

A lack of a common language impeding the emergence of cognitive affordances was a common problem for co-researchers enacting processes across the globe as well as in local areas. For example, the shipping arm of a global mining organisation used native-speaking employees in the countries in which they operated to ensure that their requirements were complied with (C5). Electrical companies employed foreign workers who had problems communicating in English (C12). A sales engineer could not get technical information requested by the potential customer in a timely manner from Chinese engineers (C13). An accountant could not communicate with customers whose English was poor (C16). A global manufacturing organisation operated in different countries and there were problems with understanding people from Thailand (C3). In a salon the Greek employee could not speak English very well, which interfered with others’ work (C4). Indicative quotes included:

“Because we’ve got multiple managers, we’ve got people across all countries reporting to managers in other countries, there is at times communication issues, we have language issues (…) A person in Thailand, English is not great, been there for 20 years.” [C3 207]

“There’s a few difficulties, for example, we did have a lady that came in (…) she was Greek. There was then conflict with all the Australian workers in the salon that couldn’t communicate with her. She ended up leaving.” [C4 46-48]

Language issues appeared also between English speaking subjects. For example, a timber salesman had to be careful what language he used when talking to people in other states or in the US:

“We call everything you put the timber into in a timber yard a racking system. I can’t use that in the United States otherwise I’d get my face slapped.” [C9 169]
5.3.5.4.2 Emotional and Motivational Affordances

When business processes involved subjects from significantly different cultures there was a potential for conflict which could facilitate negative emotional affordances and constrain motivational affordances. For example, Korean management were angry when Filipino workers did not follow their requests to wear safety equipment (C5). In a global IT corporation the eating habits of some employees differed so much that occasionally they became quite frustrating and disturbed the work of others (C6):

“People bring their home-cooked meals to have at work. What’s appetising to one, smells sometimes revolting to others. Also, traditionally different table manners (noises produced, use of hands and cutlery etc.) make a team outing a much less pleasant experience (...) Recently there was a case when someone went to the reception and complained about a strong smell like something is rotten or on fire and it does not allow us to work. After some investigation it turned out that a Russian guy had his home made lunch that filled the whole office with such a stink and around 30 people had a difficult few hours because of that.” [C6 162]

5.3.5.4.3 Social Affordances

Culture determines peoples understanding of the world around them and this has the capacity to influence business process enactment. In Asian countries hierarchy was important and people respected management, while in western countries they tended to question everything. For example, a warehouse manager in Thailand did not explicitly support the new information system so the employees did not consider it important and reverted to spreadsheets (C3). In a global manufacturing corporation the system was implemented in Malaysia within four months, while in Australia after three years it was still not finalised (C3):

“It's very cultural when you look at those countries. The boss doesn't want to do it then it doesn't happen.” [C3 56]
“It is a year late, it’s been going for two years (...) We’re able to take that same development we did and put it into Malaysia in three months (...) Here, ‘I’m too busy, I’ve got this to do, why do I need to change?’ Everyone questions everyone.” [C3 149 & 151]

The reason for western culture’s typical questioning is a poor tolerance for bad performance:

“They all know better here, everyone. And the ones who aren’t they’re looked down on, ‘Oh they’re stupid, they can’t do anything’. Also, there’s a lot of lack of respect in Australia and the western countries for people who don’t perform as well. You don’t see that up in Asia, and I’ll tell you they perform worse up there. So the tolerances for poor performance up there are much higher than here. It’s a very different atmosphere.” [C3 156]

Another thing common in Asian countries is not speaking up when things go wrong. For example, a new material requisition planner was employed and sent to the US for training. She did not understand the MRP principles and did not speak up about it. As a result she was setting the inventory items wrongly and the manufacturing floor started to receive unattainable system requests. The system had to be re-implemented and it was a costly exercise:

“You do have, in many cases, a cultural variety to that because some will see things going wrong and speak up. Asian countries, they won’t speak up, because they would be saying something to a manager and they just won’t do that.” [C3 94]

Regardless of cultural differences there were issues in every place when it came to process enactment:
“You have issues in every country. This is not just a China thing, nor is it a Japan thing. Each have their own pluses and minuses when you’re trying to change processes. Japan for instance, many, many meetings where no one will make a decision. So it’s all based on consensus. When you get that consensus and agreement, they finally move ahead, it takes you a long while to get there. Asian countries (...) they have that hierarchy. Australia and New Zealand are the worst (...). So some of our slowest projects are actually here.” [C3 147]

When dealing with another organisation it was not only important to take into account the national culture of the people involved but also the organisational culture:

“One of the things is to be very well aware of what the national culture is, but also be aware that each business has its own sub-culture. So the important things around culture are the way you communicate different types of information, the way decisions are made and the way that you form relationships and develop relationships in that culture. So if, for example, you go to the United States, they have certain ways of making decisions that are implicit, so the concept of democracy is fairly well embedded, but within a particular business you might find a democratic process where people make decisions by consensus or a completely autocratic process where the boss makes all the decisions (...) You need to find out within that particular company how decisions are made.” [C10 60]

Culture could also constrain people’s capabilities by making them conform to the expectations of those around. For example, a financial controller performed exceptionally well in the US while he was invisible in Japan:

“They raved about his capability in the US (...) I saw him when he had come back to Japan and I went (...) ‘you’re not the same person from a few weeks ago.’ He says, ‘No, I’m back in Japan.’ You know, ‘This is what’s expected of me here, so I will conform to what’s expected of me here.’ (...) And that’s why I
say, with a lot of these things, it’s not necessarily the capability of the person, but the culture around it, that can have an impact on processes.” [C3 166]

When business processes involved subjects from significantly different cultures there was a potential for conflict which could constrain interactional affordances. For example, Korean management ordered Filipino workers to wear safety equipment but they disregarded the requests. In an IT global corporation the eating habits of some employees made interactions with them less pleasant. In such cases it was important to respect the cultural habits of other process stakeholders (C5, C9, C10, and C15). For example, timber salesmen had to drink coffee with every Turkish customer (C7). A teacher could not demand indigenous African children to look at him when he talked (C15). Ship managers had to give cigarettes to the pilot to ensure that the ship would get through the canal smoothly (C5):

“We mentioned cultural awareness before. It’s very, very important, far more important than what people realise (...) For example, if you’ve got a ship going through the Suez Canal, we in fact call it the Marlboro Canal in shipping because you won’t get your ship through the canal unless you give the pilot so many cigarettes.” [C5 128]

5.3.5.4.4 Physical and Functional Affordances

Culture can influence the physical layout of the workplace which facilitated the emergence of physical layout affordances. It can also influence how rules introduced with a specific function in mind were followed. For example, in Japan employees were sitting at their desks in a way that allowed them to face their manager only (C3). In the Philippines, workers did not follow safety rules because their Korean bosses said so (C5).

As culture and language influenced people’s capabilities, emotions, motivation, use of instruments, and interactions with others, they had the potential to affect process effectiveness, efficiency and customer service which in turn related to functional
affordances. For example, culture was a reason behind people in Thailand rejecting the use of an ERP system and as a result many functionalities assisting in the process enactment became unavailable (C3).

5.3.5.4.5 Summary

The human culture theme was visible in 14 interviews. Co-researchers not discussing this particular theme were from small businesses, such as a dental practice and an ERP consultancy firm. At the other end of the scale, some co-researchers working for multinational global corporations assigned extreme importance to culture, maintaining that it drives the way we use instruments and deal with other people, and has the capacity to constrain even our capabilities (C3, C5, C10). Cultural differences could create conflicts leading to decreased effectiveness and efficiency, poor quality and poor customer service, weakened collaboration, unsafe work practices, and failure to utilise people’s capabilities.

A clear relationship was seen by co-researchers between the phenomena represented by codes from the human culture theme and the manifestation of psychological, social, functional and physical affordances, which is presented in Figure 5.4. The arrows indicate perceived relationships.

Figure 5.4: Perceived relationships between phenomena represented by common codes from Human Culture theme and manifestation of affordances.
5.3.5.5 Process Inputs Theme

The process inputs theme (see Table 5.13) included codes relating to technology and changes which had significance for all co-researchers and instruments, information and physical layout which influenced the majority of co-researchers. A minority were also impacted by documentation.

The interaction between properties of the process, which are influenced by process inputs, and the properties of the process subject has the potential to contribute to the emergence of different categories of affordances. These affordances include cognitive, emotional, motivational, social, physical, and functional and are detailed in the following sections.

Table 5.13: Six common codes from Process Inputs theme identified in business process enactment experiences of all co-researchers.

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5.3.5.5.1 Cognitive Affordances

Information and documentation was frequently stored, retrieved and exchanged digitally which facilitated cognitive affordances and contributed to transparency and visibility. A dentist could have multiple copies of documents (C1). An IT director introduced a Share Point based tool to ensure that all process subjects had access to detailed project information (C3). An ERP consultant was implementing Link Server so he could be notified of events when they happened (C2):

“Link Server (...) that sends out all the information, like as soon as it happens, it notifies. Even when you arrive or someone leaves now the site (...) Once the
Link Server comes up I get notified anywhere in the world. So all those things, once we start using them it increases (...) customer service to the next level.”
[C2 73]

The most common problems with information that could constrain cognitive affordances related to keeping it up to date or being forced to keep too much of it. For example, in a global IT corporation continuous updates and a multitude of versions were difficult to follow (C6):

“The problem with documentation and especially on-line documentation, because initially you print the documentation and it goes out of date pretty quickly (...) it had to be in a controlled environment that everybody had their link to the documentation but they should not print anything locally (...) they can go to the link and check the latest version. However, even the online systems that were supporting all the documentation changed (...) those documents are not always migrated intact to the new system (...) sometimes it can take a while before someone discovers it.” [C6 72]

The study found a change of instruments and technology could be quite cumbersome and stressful to the process subjects and the business should ensure that provisions are made for proper training and testing so that the cognitive affordances would emerge. For example, ERP customers could not use the system properly when training was not provided (C2). Laboratory employees had to do tests on two systems for a year before the new system could displace the old one (C11). A machinist always received training in the new version of the equipment (C14).

“Engineering changes like electronics, every year, every five years so a new systems come on the market so we have to learn them, when we've got new machines they have a new operating system so you have to have training.” [C14 10]
To facilitate the emergence of cognitive affordances any changes to the processes should be made in consultation with the process subjects. Relevant information about the changes should also be provided so the subjects have enough time for the required preparation. For example, a manager of a not-for-profit organisation complained that she was not able to know the nature of changes that were coming into effect within 40 days and that those changes were made without any consultation with the industry (C8).

“Now, when age care reform is on the way we’ve got a lot of problems because from 1 July there will be two sets of guidelines (...). And we don’t know to this time [23 May] what kind of guidelines there will be. They are still discussed in the government and there is not much consultation in our industry because they give a one or two day response to a new proposition.” [C8 56]

5.3.5.5.2 Emotional and Motivational Affordances

While instruments and technology could help to do the work they could also be disturbing and frustrating for the subjects leading to the emergence of negative emotional affordances and a lack of motivational affordances. For example, shipping employees were frustrated when the new system had less functionality than the old one (C5). A bakery manager was upset when the proper installation of new equipment took four months (C7). A product design engineer could not easily communicate with people around the globe with the existing teleconference facility (C10). An electrician complained about new system versions losing their existing functionality (C12). A machinist was regularly preparing orders that could not be performed (C14). An accountant complained about the system that was out of date and made her work cumbersome (C16). A beautician was annoyed with being forced to continuously learn new technology (C4). In a global IT corporation employees were dissatisfied with the lack of working space (C6):

“They do keep introducing new software (...) and it’s just difficult. I went and did my course just specifically for beauty therapy, I do not wish to learn
computers and software and upgrades (...) I try so hard and it’s just very stressful for me.” [C4 64]

“The problem is the office space, parking space (...) People aren’t happy and that stuff it reflects in people’s work.” [C6 97]

In some cases the requirement of keeping too much data could facilitate the emergence of negative emotional affordances. For example, a not-for-profit manager and an electrician were annoyed with the bureaucratic requirements of recording many work events.

“We have so much paperwork (...) For example, if your house here had no power, we’d get the job despatched to us on the phone, we’d have to write that job on our sheet, we get here and we have to do a risk assessment once we arrive, fill that in, and then do the work, complete the job out on the bit of paper, and then ring that exact information back to the despatch centre to resolve the job, and then once we’d done that, then we write the job down on our time sheet and the times that we’re there, so it’s a lot of double handling.” [C12 34]

Businesses changing instruments and technology should ensure that future users are made aware of the benefits that new solutions will bring to the business and to them personally to encourage emergence of motivational affordances. In a global manufacturing corporation, management always clarified the benefits of change to employees (C3):

“It’s always, what’s in it for me? Why should I make a change? 'Well it’s good for the company.', 'I don't care, what's in it for me?' So when we go into meetings we have to answer that question ourselves before we step in because we know we're going to get it.” [C3 245]
Changes to the processes should be made in consultation with the process subjects. For example, a bank employee was frustrated with changes that did not bring any real improvements.

“What frustrated us a lot of the time was that whenever you got a new manager (...) they always change for the sake of changing, just so that they could put their stamp on the new direction, when there’s nothing wrong with the old direction. And that’s really frustrating for the people on the ground. You know, if something is working, if it’s not broken, don’t fix it.” [C15]

In some cases changes stressed process subjects because they brought uncertainty about their future. In a timberyard or pharmaceutical laboratory a new machine increased the likelihood of people being dismissed.

“The company introduced a machine to get rid of the people because the people were slowing down so much because of all the regulations coming through, to protect them (...). But who’s going to employ the people?”[C9 39-41]

5.3.5.5.3 Social Affordances

Technology was often used within a process to manage and share information and related documentation, and had the potential to contribute to interactional affordances, which in turn could make the processes more effective and efficient. Similarly, the physical layout of the space could facilitate interactional affordances. For example, an ERP customer could not get payment for their services from the client when the required documentation was not provided (C2). An IT security manager could easily interact with others in the open space layout (C6). A dentist had to send patient records to dental technicians so the crown could be made properly (C1):
“I communicate with the specialists. If I use the intra-oral camera, so when you do crowns you need to match the colour of the teeth so I can take the photographs with my intra-oral camera and send it or email to my technician.” [C1 90]

Cultural affordances could also influence the physical layout of the space. For example, in Japan typical workplace was set as an open space with managers sitting at the front and looking at their staff (C3).

5.3.5.5.4 Physical and Functional Affordances

Resources used and outcomes produced by the process had an impact on the work performed (C1, C4, C5, C6, C12, C13, C14, C16). The physical layout of the workplace facilitated or constrained the emergence of physical layout affordances. For example, for a beautician the waxing room was too small and it was difficult to move between the customer and a waxing pot (C4). A dentist’s work became more difficult when a new chair was installed (C1):

“When the patient is lying down like the chair is, I don’t have enough space between cupboards and the chair.” [C1 62]

Open space layout was particularly commended by co-researchers. For example, for an IT security manager (C6) and an accountant (C16) it improved collaboration and learning:

“It’s quite an enclosed space that I work in, I do find it quite isolating (...) I don’t like it because my back is to whoever is passing so I don’t look like I’m approachable, I don’t see or hear what might be going on behind me that I perhaps could be involved in or should be involved in.” [C16 186-188]

Technology could facilitate physical sensory affordances by making more detailed information available to the process subjects.
“It is easier. When you’ve got digital you can enlarge it and see it in a bigger picture. I can then email to specialists and there was only one copy, the old way. So now I can just print out as many copies as I wish.” [C1 35]

Instruments and technology used within the process could make work easier and information and documentation more readily available. This in turn improved process effectiveness, efficiency, collaboration and customer care for the majority of co-researchers. For that reason many changes were introduced in co-researchers’ organisations to reap the benefits of available advances in instruments and technology and facilitate new functional affordances. For example, an ERP provider implemented a new timesheet system to track details of jobs so an itemised breakdown of the time charged could be provided to customers thus minimising complaints (C2). A bakery manager installed highly advanced baking equipment to improve the freshness of the bread (C7). A product design engineer could teleconference with people around the globe when a new 3D camera was introduced (C10). A dentist changed a lot of equipment to make her work easier (C1). Tablets and the Internet allowed a timber salesman to connect to the company database and process orders at the customer’s site (C9):

“I got a digital x-ray. The old dentist used to keep his x-rays in the film form (...) It made my life easier (...) My nurse, the same nurse who was with me, she was wasting more time because she had to do the whole process. And now she is just in here and this takes probably 30 seconds [as opposed to] three minutes.” [C1 13-17 & 120]

“The benefit, the changes that the computer systems have brought in and the little iPads (...) I can sit in front of a customer and take his order while I’m talking to him and put it into the computer (...) When I first started on the road as a rep, back in 89 (...) my biggest headache was trying to find a telephone box that worked and that’s the changes in the industry.” [C9 22-24]

To realise potential functional affordances it was up to people to use the existing information. For example, in a global manufacturing corporation detailed
information was captured from the point of sale in China but no one ever used it, and this frustrated the IT department (C3).

“We have collected information every day from 87 stores, but no one’s doing anything with it, it’s coming into the database and sitting there.” [C3 128]

In a bakery the old manager had a system but did not use it and the business suffered as a result (C7):

“He just didn’t utilise those tools. He never used them to analyse his business and he didn’t use them to see how well his staff were performing (...) In terms of figures, when he was operating the store, at the end of the week it was doing $15,000 a week in sales, and I now achieve nearly $22,000, so I’ve nearly put $1000 a day on sales, and when you’re talking about bread, it’s really quite significant.” [C7 59-65]

In order to use instruments and technology, people had to manipulate objects, which was only possible when manipulation affordances emerged. For example, a dentist could only make a photo with an intra-oral camera when she pressed a pedal (C1), an IT security manager could only communicate with people in other offices around the globe when he turned on a computer and ran a teleconference application (C6), and a machinist could only cut metal with specialised equipment (C14).

People had to have the required knowledge on how to use some instruments, otherwise manipulation and functional affordances were constrained. For example, a machinist had to know how to open a specialised toolbox and how to use precision machinery to cut the metal parts.

5.3.5.5.5 Summary

The process inputs theme was discussed by all co-researchers. Changes were common occurrences. People at the highest organisational level, such as an IT
director, assigned extreme importance to process changes as they are considered as a key way to ensure business success. At lower organisational levels changes were not always welcomed, especially when they were made without process subject involvement, as they required a lot of additional work and were not always perceived as being for the better. Therefore, special care had to be taken within the transitional period to facilitate cognitive, emotional and motivational affordances to encourage the employees’ acceptance. Technology was also clearly visible in all interviews, which confirmed the pervasive nature of this phenomenon in current times. When technological solutions were not working properly they often caused frustration and demotivation for people at work. Instruments were discussed by the majority of co-researchers, and their physical layout could influence process effectiveness, efficiency, quality, customer service, knowledge, collaboration, and motivation.

A clear relationship was seen by co-researchers between the phenomena represented by common codes from the process inputs theme and the manifestation of functional, physical, psychological and social affordances, which is presented in Figure 5.5. The arrows indicate perceived relationships.

Figure 5.5: Perceived relationships between phenomena represented by common codes from Process Inputs theme and manifestation of affordances.
5.3.5.6 Process Rules Theme

From the rules theme phenomena represented by common codes (see Table 5.14) included compliance, reasonableness and safety which had significance for the majority of co-researchers. A minority was also impacted by variety, clarity and security.

Properties of the process, which are influenced by process rules may intersect with characteristics of the process subject and contribute to the emergence of different categories of affordances. These affordances include cognitive, emotional, motivational, social, physical, and functional and are outlined in the following sections.

Table 5.14: Six common codes from Rules theme identified in business process enactment experiences of all co-researchers.

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5.3.5.6.1 Cognitive Affordances

Variety and a lack of clarity within the rules made compliance challenging and constrained the emergence of cognitive affordances. For example, a shipping arm of a global mining company had to conform to multiple standards and some of them were not descriptive enough to ensure effective safety (C5). An IT security manager was confused about which rules to follow when he belonged to a US functional unit and an Australian geographical unit (C6). Employees of a not-for-profit organisation had to deal with multiple rules within one project due to regulation changes or grants received from different bodies (C8):
“Now, when age care reform is on the way we’ve got a lot of problems because from 1 July there will be two sets of guidelines for our one programme, and existing clients will have different guidelines, and new clients from 1 July will have other guidelines (...) We’ve got some funding from state government and some from federal government. There should be one set of rules, because they try to put all services together but if the state leaders do not sign the agreement we have to follow both.” [C8 56 & 77]

5.3.5.6.2 Emotional and Motivational Affordances

In some cases the introduction of unreasonable rules lead to closing a specific arm of a business and triggered negative emotional affordances. For example, a global manufacturing corporation had to withdraw from the Australian market (C3):

“Our [products] can’t be sold in Australia because of local laws regarding that. So those products just can’t come in. And it’s not a safety issue, it’s a cosmetic issue because Australia had the rules that said, ‘All brakes need to be red’. Well, you want us to change all our manufacturing and put in red brakes just for Australia? Oh yeah, [products], you look at them, they’re all colours.” [C3 170]

Variety and a lack of clarity of rules could bring about negative emotional affordances. For example, a teacher was frustrated about the rule of wording students’ reports in a positive language as it could mislead parents about children’s progress (C15). In a global IT organisation there were different rules for employees belonging to specific groups, and people were often confused and annoyed (C6):

“There’s a huge uncertainty which process we should follow because we report to US and which process we should follow because we are in Australia. There’s a whole stuff - bunch of things that we are included – if something good happens in Australia sometimes we’re not included because we are not part of the group. When the new phones were given away (...) we were not part of
it. But when it is the meeting, we are obliged to – it’s compulsory for us to participate in. Which sort of annoys people a lot.” [C6 92]

Safety was another aspect of processes discussed by co-researchers. Opinions on specific safety improvements varied however. In some cases process stakeholders were happy while in others they were annoyed. For example, a product designer was pleased with the new safety assessment that was made mandatory for all projects (C10). A microbiologist appreciated that her work with dangerous chemicals was safe (C11). A machinist was glad that the machines could only be usable once they were locked and safe (C14). An electrician welcomed the gradual strengthening of safety regulations which decreased fatalities in his industry (C12). A timber salesman (C9) and a builder (C15) were annoyed with inefficiencies brought about by new safety rules:

“The changes have been way for the better than for the worst obviously, because (...) there were quite a few fatalities through the 80s and 90s in our industry (...) but that has really dropped off over the last few years.” [C12 12]

“The OH&S that’s been brought into the country (...) to the point where it’s gone to a ridiculous level (...) it’s just an Australian regulation based on companies that have drivers picking up pallets. We’re not picking up pallets, we’re picking up six metre long packs of timber and working them through different areas. The laws have come in to be all the same for everyone but they haven’t looked at the industries they’re working with.” [C9 29-33]

5.3.5.6.3 Social Affordances

When processes are performed the participants are subject to existing rules that are historically developed within the relevant community. Such rules influence our understanding of what and how to do things and therefore relate to cultural affordance. The most commonly discussed aspect of regulations was compliance. For many co-researchers rules would be observed if they were reasonable. For example, for a dentist rules should follow common sense and while infection control
regulations to protect patients are useful, others such as the barrier rule can cause harm (C1). An ERP consultant believed that rules could be beneficial to some process stakeholders but a burden to others, so should be carefully established as a compromise between conflicting agendas (C2). A beautician was regularly breaking the ban on cutting cuticles because customers requested the treatment (C4). A not-for-profit manager complained about the rule forcing an 85-year old to introduce life changes so they would be healthier in a year (C8). A timber salesman was frustrated with the new safety rules which made work in a timberyard very inefficient (C9). An Australian factory employee supervising the induction test required for all visitors was giving them the required answers, as he understood how impractical the rule was (C13). A bank employee asked a regional manager without authority to overwrite a credit manager’s decision rejecting a loan (C15). Employees of a global IT corporation did not swipe their cards on entry into the office during peak hours in the morning (C6):

“In order to get to the building in our offices people need to swipe the cards. So when a whole group of people (...) goes in (...) each of them is supposed to swipe the card (...) in many cases people just don’t do it (...) not practical, yes. It’s probably useful. It’s not practical.” [C6 138 & 140]

In some cultures people were more inclined to observe the rules as they respected authority and tended to follow it without much complaint. For example, in Thailand people follow the usage of an information system in accordance with the instructions of their boss (C3):

“It's very cultural when you look at those countries. The boss doesn't want to do it then it doesn't happen.” [C3 56].

5.3.5.6.4 Physical and Functional Affordances

Many rules applicable during business process enactment were historically developed within the relevant community. These rules have a specific functional
purpose and therefore facilitate functional affordances. This included specific legislation aimed at protecting a group of people, such as the public or employees. Other sets of rules included organisational guidelines aimed at advancing business objectives which in many cases were directed at making the processes more effective and efficient. For example, a machinery manufacturer banning talking on the mobile during work (C14), a dental practice introducing an end of the day instrument check (C1), an electrical company establishing monthly meetings of the whole staff (C13).

In order to use instruments and technology, people had to manipulate objects, which was only possible when manipulation affordances emerged. Such affordances could be facilitated by rules that determined who was allowed to perform manipulation. For example, the serving of alcohol by a waitress without an alcohol licence, was possible but due to the existing regulations was not performed (C4).

Many co-researchers discussed the safety aspects of their work. To comply with such rules special instruments such as protective clothing or fire extinguishers had to be used. In some cases process stakeholders welcomed safety improvements. For example, a dentist installed a safety switch to ensure patient safety (C1). A bakery manager was strictly following a Food Safety Programme to ensure that customers were safe (C7). A shipping arm of a global mining company installed its own safety inspectors in the shipyard when unsafe practices were discovered (C5):

“We contracted basically a Korean company to construct the vessels in a new shipyard (...). So very, very new shipyard. Its safety standards were not what we would expect, so we changed around (...) we put on additional HSEC managers in order to ensure that our employees were safe and also those of the shipyard because we were dissatisfied with the way they were going about the day-to-day tasks of building a ship.” [C5 10]

In some cases, however, process subjects complained about safety standards as they were slowing the down work too much, and were therefore often bypassed. For example, a forklift driver not using the required seat belts (C9), or a construction worker not using the required harness (C15):
“If you’ve got to go above two metres high, you’ve got to have a harness on you (...) we’re all up there, two metres high, and no harness, because if you put the harness on, firstly there may be no harness in the ute because it’s off site and so on, or it’s just going to take too long and you’ve got to get a job done, it’s going to take too much to get up on the roof and do this.” [C15 105]

In some circumstances a variety of rules could present an opportunity to set up the best possible business structure advancing the business goals and contributing to the emergence of functional affordances. For example, a global manufacturing and selling corporation closed a Hong Kong entity and established a Luxemburg entity to save on tax:

“Things going in and out of China are now effectively owned by a Luxembourg entity (...) and this is all for tax purposes. Millions of dollars on taxes could be saved if the legal people set structures.” [C3 98]

Rules with heavy fines were usually strictly followed. For example, a not-for-profit manager was checking clients’ case notes every few days, as failure of a possible audit could lead to the loss of licence to deal with elderly people (C8). A male teacher was always following state rules on taking girls on excursions as otherwise the private school he was teaching at could be severely penalised (C15). A bakery manager was checking safety books every day (C7):

“Just say the Health Department (...) decided to walk in today and requested to see those food safety books, I have to hand them over. If they’re not completed – they’re not signed – they can slap me on the wrist with a $50,000 fine. I check it daily to make sure that it’s filled out – and if someone hasn’t filled it out, they’d get a letter of written warning. I have to do that to protect myself, obviously.” [C7 105]

For some co-researchers security rules were important in the processes they performed. While such rules had the functional purpose of securing data they could
also be related to physical affordances. For example, an IT security manager was complaining that company regulations on securing data were not always enforced. A lack of security created an opportunity for data to be accessed by undesirable people:

“People carry laptops, people carry USB sticks with the company confidential information and those resources are completely unprotected (...) there’s a company policy to have the password, to have a pin number and stuff but I think there are still people who don’t do it.” [C6 115]

5.3.5.6.5 Summary

While the rules theme was discussed by all co-researches, the relevant frequencies of six common codes significantly varied. For some co-researchers many rules were either not applicable or became so obvious that they were barely noticed. Compliance, reasonableness and safety were considered by the majority as important in business process enactment. Experiences of co-researchers with different rules varied from very positive to very negative. Some regulations were strictly adhered to while others were often questioned and occasionally broken. The clarity, reasonableness and variety of rules had the potential to influence compliance while security, safety and compliance could influence process effectiveness, efficiency, quality, customer service, knowledge, collaboration, and motivation. There was some disagreement when it came to safety. An electrician was very happy with the increased regulations as they decreased casualties in his industry. A builder and a timber merchant, however, complained that such legislation slows down the job too much and in some cases forces employers to replace people with machines. For global organisations the variety of rules created opportunities to setup beneficial business structures.

A clear relationship was seen by co-researchers between phenomena represented by common codes from the rules theme and the manifestation of functional, physical, psychological and social affordances, which is presented in Figure 5.6. The arrows represent perceived relationships.
5.3.5.7 Process Division of Labour Theme

Phenomena represented by common codes from the division of labour theme (see Table 5.15) included management, ownership and monitoring which were important to the majority of co-researchers. Some were also impacted by planning, stakeholders’ conflict and power.

The business process is influenced by the division of labour. In turn, cognitive, emotional, motivational, social, physical, and functional affordances may emerge from the relationship between properties of the process and characteristics of the process subject. These affordances are explored in the following sections.

Table 5.15: Six common codes from Division of Labour theme identified in business process enactment experiences of all co-researchers.

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5.3.5.7.1 Cognitive Affordances

Management improved when cognitive affordances emerged through business knowledge and transparent systems where information on the utilisation of resources was available and the progress of the processes and team members could be monitored. For example, an ERP consultant implemented a system whereby information on jobs was easily available (C2). An IT director introduced a new solution to make projects visible to different stakeholders (C3). A bakery manager used an information system to measure the performance of her employees and identify if any of them needed help and training (C7). A machinist was annoyed with management not having adequate knowledge to deal with work problems (C14).

“We (...) monitor the projects we have going on across the region to ensure that the various projects that need to be done are visible, we have resources in place and we can project manage those resources.” [C3 22]

“I have a feeling that the manager is not up to the job. They don’t understand what the problem really is (...) they’ve got their positions because of friends (...) In my opinion the manager of that particular sector should be a man who comes from the floor and knows exactly what machines can do, how they work, what’s the process involved.” [C14 48 & 133]

Ownership of processes was better when cognitive affordances emerged and people were clearly aware of their responsibilities. For example, an ERP consultant was complaining about a project manager who did not ensure that everyone knew their roles (C2). An IT security manager frequently had problems finding a person responsible for a specific task that was not performed properly (C6).

“I think there’s the big thing about the processes is ownership, ownership of the part and who’s responsible for what and when. The process includes many different steps and many different groups and many different people they have different knowledge and skills, it’s so important to know who owns what
and who can fix what (…) things break and sometimes nobody knows how to fix it or nobody knows how to find the person who’s responsible.” [C6 121]

5.3.5.7.2 Emotional and Motivational Affordances

Poor planning posed the risk of facilitating the emergence of negative emotional affordances and constraining motivational affordances. For example, a machinist was annoyed with managers who did not direct and plan the jobs (C14). A timber salesman was frustrated with builders/managers who planned poorly and prepared the orders at the last minute (C9):

“The builders are building your house, all of a sudden he needs his materials. He tells the retailer that he needs his delivery on Monday and this is Friday lunchtime. They ring us with the order and say, ‘We’ve got to have it in our yard Monday morning’. And we say, ‘No, you can’t have it because we can’t do it’ (…) That’s the major frustration in this industry is that the wholesaler and the timber merchant have to deal with builders who don’t programme themselves to have everything ready when they need to have it. Everything’s last minute.” [C9 133]

Management was also a key to motivating people, which influenced motivational affordances. For example, an ERP consultant was demotivated because the manager did not offer him opportunities to succeed (C2). One of the reasons a not-for-profit manager was employed was to deal with employees’ appraisals. These had become mandatory for the organisation to be eligible for some grants (C8). A shipping manager was motivating his employees by adjusting their work to their preferences (C5):

“Everybody’s motivated in different ways, and understanding those key drivers for each of your team is one way of getting the best out of that team (…). So you would just cater for their workload according to the individuals.” [C5 96]
Ownership of processes was also better when emotional and motivational affordances emerged and people were motivated to fulfil their responsibilities. A product design company respected people’s views and allowed them to choose projects to work on. In a pharmaceutical laboratory there was no challenge at work and employees did not own it (C11). A machinist was not interested in giving suggestions for improving processes as the company did not value it (C14).

“There was a strong respect for people’s personal views on what work they would or wouldn’t do, for example (...) one of the projects was the development of a new mouse trap (...) and people would not work on that project because they thought that, ethically, it wasn’t environmentally sound (...) I think it was very important to have the people to own what they were doing to make that project a success, so you needed people to be enthusiastic and committed to that success.” [C10 83-85]

“They don’t feel ownership and they don’t feel that they are using their brain, they just do. Like in a factory, you are just in a process line and you just put things in there (...). They are not as proud and happy with that.” [C11 73]

5.3.5.7.3 Social Affordances

Some of the co-researchers noted that different process stakeholders could have different objectives and occasionally conflicts could arise which had the potential to influence interactional affordances. For example, ERP consultants often underquoted implementation to ensure that they won the project which then resulted in limited training and poor process enactment in the future (C2). In the shipping arm of a global mining company conflict arose between Korean managers and Filipino workers (C5). In a global IT corporation employees were monitored through the performance system which forced them to compete against each other (C6).

“Company values teamwork but at the same time performance review creates competition so people supposed to work together and be friends if possible, working together well and investing into one another’s success, they compete
Management should mitigate conflicts that arise in the processes. For example, in a product-designing firm conflict between designers and manufacturers was softened by facilitating the emergence of interactional affordances through the involvement of the latter group in the design process.

“There’s a big cultural difference between the designers and the manufacturers, even though they might belong in the same company and work in the same building; they think differently and work differently. So a designer likes to be creative and flexible, and the manufacturer likes to be as inflexible as possible and lock things down and control everything (...). So there is a big cultural gap there and the worst way to do that is to hand it over to the manufacturer at the end. The best way to do it is to get the manufacturer involved from the beginning.” [C10 74]

Interactional affordances had the potential to make people feel part of the team which increased their motivation and ownership of specific tasks, and ultimately increased process effectiveness and efficiency.

“People get motivated by the way you go and talk to them.” [C11 137]

The final aspect of process enactment discussed by the co-researchers was power. Individuals with some level of power were more likely to resist changes that could undermine their position. For example, some users in an ERP customer organisation resisted the implementation of a new information system as it gave everyone access to information (C2).

“Some of them are power oriented. Like they’re scared that if they introduce the process and it becomes transparent then they won’t be able to maintain their dominance in the organisation.” [C2 83]
5.3.5.7.4 Physical and Functional Affordances

When processes were performed by multiple individuals and teams, functional affordances were facilitated by the division of labour which through planning, management and monitoring determined who was responsible for specific tasks and if those tasks were achieved.

One of the crucial roles of management was planning the work, and in some cases instruments such as ERP systems could provide functionality to plan the work. For example, an ERP consultant stressed the importance of the manager understanding all the requirements and planning work accordingly (C2). After an audit, a not-for-profit organisation was required to employ a manager to deal with strategic planning (C8).

“In the last three years we had a lot of changes. We had to appoint the manager and we have to do (...) plans, strategic plans, the governance documents, risk management. These are now required.” [C8 104]

By determining who is scheduled to perform the work, the division of labour had a clear impact on manipulation affordances. For example, in a bakery a small-built manager could not cut the dough fast enough and the job had to be shared with stronger-built employees (C7).

5.3.5.7.5 Summary

The division of labour theme was discussed by 15 co-researchers, with frequencies of the six common codes varying widely. Management was most clearly visible in experiences of the majority of co-researchers and had the power to facilitate or constrain the work of others. The involvement of multiple individuals and teams in the business processes created the need to plan and monitor the work to ensure that people own their responsibilities, as well as mitigate conflicts between process
stakeholders. Proper coordination of efforts influenced process effectiveness, efficiency, quality, customer service, knowledge, collaboration, and motivation.

A clear relationship was seen by co-researchers between phenomena represented by common codes from the division of labour theme and the manifestation of functional, physical, psychological and social affordances, which is presented in Figure 5.7. The arrows represent perceived relationships.

Figure 5.7: Perceived relationships between phenomena represented by common codes from Process Division of Labour theme and manifestation of affordances.

5.3.5.8 Process Attributes Theme

Common codes from the process attributes theme summarised in Table 5.16 did not relate to process elements but to process characteristics that were the result of different elements. For example, process automation, integration, reliability or universality were enabled by the deployment of specific instruments within the process. Easiness and standardisation were the outcomes of specific instruments and rules. Finally, effectiveness, efficiency, customer service, quality and best structure reflected the ultimate process objective and were the effect of other process components. Due to the specific nature of the process attributes group the analysis of their influence on the manifestation of process affordances was not conducted. Any links existing between process attributes and the emergence of process
affordances result from the relationships between other themes and process action opportunities which were described in previous sections.

Table 5.16: 15 common codes from Process Attributes theme identified in business process enactment experiences of all co-researchers.

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5.4 Chapter Summary

The chapter described the hermeneutic study undertaken to understand people’s actions within business processes. The researcher’s bias was addressed and codes and themes representing issues important to people engaged in the performance of process tasks were determined. The chapter established perceived relationships between phenomena represented by codes and the manifestation of different business process affordance categories as presented in Figure 5.1 to Figure 5.7. The extent to which specific issues were shared between different co-researchers was also explored.

The next chapter continues the data analysis using the imaginative variation technique to explore in more depth the emergence of affordances and relationships between them.
6 IMAGINATIVE VARIATION

This chapter explores the co-researchers’ stories in order to find possible meanings of their experiences. Following the chosen methodology (see chapter 3), imagination is utilised to discover possible interdependencies (dynamics) explaining the emergence or constraint of business process affordances.

The first part of the chapter revisits the AAF model presented in section 2.5. It reflects on the findings that emerged during the phenomenological reduction stage and adjusts the framework to incorporate the research themes identified in chapter 5.

The next section looks into the process enactment experiences to identify how common the discovered relationships between the elements of the AAF model (see Figure 2.9) and the emergence of specific categories of affordances are. The concept of essential and supplementary elements of process affordances are introduced to reflect different types of encountered influences.

The third part of the chapter looks into the instances of the simultaneous emergence of different categories of business process affordances. The purpose of this approach is to explore relationships between the affordances themselves.

The final section of the chapter investigates how the research themes are affected by process affordances. The notion of primary and secondary action opportunities for each theme is introduced to reflect the strength of the encountered links.

6.1 AAF Adjustments

The original AAF model, as presented in Figure 2.9 was developed from the literature and included the adapted Activity Theory diagram notation as proposed by Engeström (Engeström 2000) modified to reflect the specifics of the business process context (see section 2.5). Following the phenomenological reduction stage the concepts depicted in the diagram were amended to map the themes which emerged
from the interviews. The notion of human “capabilities” and “motivation” related to
the “process subject” while “interactions” and “culture” were linked to “process
stakeholders”. These research themes (capabilities, motivation, interactions, and
culture) were noted on the model in the relevant areas. This was an important
adjustment ensuring that all themes identified during the research as influencing the
emergence of different process affordances are reflected in my model. Finally, as the
idea behind introducing the process approach to business is based on increasing
effectiveness and efficiency, the activity system object became “effective and
efficient process enactment”. The adjusted AAF model is presented in Figure 6.1.

![Adjusted AAF model](image)

**Figure 6.1: Adjusted AAF model.**

### 6.2 Essential Elements of AAF

Affordances can enable human actions and therefore may increases the quality of
process enactment (which I consider as an activity system). Consequently,
consideration of affordances during the design can facilitate process enactment. All categories of affordances (physical, psychological, social and functional) presented in Figure 2.3 were identified in co-researchers’ experience of process enactment, and insights accumulated so far have been consistent with my theoretical model described in section 2.5 and illustrated in Figure 2.9. The current section deals with the main part of imaginary variation and provides insights which will significantly transform the model in response to the observations made in Table 6.1.

What clearly emerged from the data during the phenomenological reduction stage (see section 5.3) were relationships between elements of the process enactment activity system (process subject, stakeholders, inputs, rules, and the division of labour) and the manifestation of different process affordance categories. To differentiate between how common the discovered relationships were I introduced the concept of essential influence to identify components of the activity system that are always present when a specific affordance category emerges and supplementary influence to identify components only encountered in some circumstances.

The following subsections, corresponding to different categories of affordances provide an explanation of the insights gained from the interviews in regards to the type of relationship encountered between activity system elements and process affordances. Each section will summarise these insights and then provide a reflection, which will ultimately extend the model to reflect essentiality of discovered relationships.

6.2.1 Physical Affordances of Business Processes

As explained in section 2.2.2, physical affordances relate to handling the process environment using our bodies and determine what we humans are physically able to do. Physical affordances of business processes experienced by the co-researchers included: layout, sensory and manipulation affordances (see section 5.3.5).
6.2.1.1 Layout Affordances

Layout affordances relate to the spatial arrangements of objects in the environment and were discussed by the majority of co-researchers. A dentist (C1) and beautician (C4) complained about working space being too limited to allow them to work comfortably. An IT manager (C6) and accountant (C16) praised the open layout enabling collaboration and learning. A sales engineer (C13) complained about wasting too much time on moving between the machines or offices during his everyday work. Finally a fleet manager (C5), a microbiologist (C11) and an electrician (C12) stressed the importance of layout in ensuring workplace safety, while a microbiologist (C11) and machinist (C14) mentioned spatial arrangements enabling a strictly controlled environment so that the chemicals used in the process did not affect people, or metals were cut with precision to a fraction of a millimetre.

Some co-researchers did not discuss instances of the emergence of layout affordances. Such affordances may not be of much importance to them. For example, an ERP consultant (C2), an IT director (C3), a not-for-profit manager (C8) and a product designer (C10) for most of the time work fairly independently of others in their separate offices and any cooperation with locals takes place during the occasional official meetings and with non-locals through the available technology. A bakery manager (C7) introduced many process changes since taking over the business two years before (instruments, technology, people, processes) but none of those changes related to the spatial arrangements, which may indicate that the existing workplace layout was satisfactory and taken for granted. A timber salesman’s (C9) work involved predominantly travelling to the clients’ sites. A teacher (C15) worked with students in the classroom and quite probably the layout of desks depended on the specific task at hand. For example, desks could easily be separated when the individual tasks were performed, or combined when the teamwork was required.

Layout affordances were facilitated or hindered by the physical layout of the working space (see section 5.3.5.5.4) and human culture (see section 5.3.5.4.4). At the same time such affordances could make the work and exchange of information easier (see section 5.3.5.5.4), enable learning (see section 5.3.5.1.5 and 5.3.5.5.4) and
collaboration (see section 5.3.5.3.4 and 5.3.5.5.4), motivate people (see section 5.3.5.2.5), assist securing data (see section 5.3.5.6.4) and ultimately make processes more effective and efficient (see section 5.3.5.5.4).

Reflection on the experiences of different co-researchers with layout affordances allowed me to establish that process subject and inputs had an essential influence on such action opportunities as their impact was present in every instance of the manifestation of such affordances. Rules, community and division of labour had the potential to impact layout affordances, however their effect was supplementary. That is, there were cases where each element was non-existent and affordances would still emerge. For example, in a global manufacturing corporation cultural rules in Japan ensured that workers faced their managers (influence of subject, inputs, rules, community and division of labour) (C4). In an Australian corporate group providing waste management services, on the other hand, the workplace layout was determined by the workplace functional unit (influence of subject, inputs and division of labour but no rules and community) and payroll staff were located in an isolated office (pilot study).

### 6.2.1.2 Sensory Affordances

Sensory affordances relate to our sensory actions, such as seeing and hearing, and were discussed by a minority of co-researchers. A dentist (C1) praised technology such as the intra-oral camera which allowed her to create a digital image of a tooth that could be enlarged later to see details that are invisible when looking at the real tooth. A beautician (C4) often used testers which when applied to the customer’s skin caused a colour change that could be seen with her eyes and enabled her to determine if a specific treatment was safe.

The majority of co-researchers did not discuss instances of the emergence of sensory affordances. It may be that such affordances are simply not very important to them as during their work the subjects were able to see the relevant process inputs with their own eyes and without any special equipment such as a microscope (C2, C3, C5,
C6, C7, C8, C9, C13, C14, C15, and C16). For example, a bakery manager could easily see the bread or a sales engineer could clearly see the air conditioning equipment. However, some co-researchers quite possibly take sensory affordances for granted and thus not discuss them. This confirms the notion that things become invisible to us when we are familiar with them (Heidegger 1962). For example, a product designer worked on a DNA extractor, and a microbiologist with bacteria, and without a microscope facilitating sensory affordances, they were unable to see the required process inputs. While sensory affordances were often accompanied by functional action opportunities it is important to note the difference. A specific process input, such as a dental computer application, could facilitate functional process affordances by providing the relevant information on the screen. It was only when the system provided the information that could not be seen without the technology that the sensory affordances emerged. For example, when the dentist looked at a patient’s tooth, she was not able to see the exact shades, due to the limited space inside the oral cavity and the relatively small size of that tooth. This information was important for making a crown. The digital image of the tooth, however, could be enlarged and easily looked at, hence sensory affordances were enabled.

By reflecting on the experiences of different co-researchers with sensory affordances I established that process subject and inputs had an essential influence on opportunities for sensory action as their impact was present in every instance of the manifestation of such affordances. Process stakeholders and the division of labour had the potential to impact affordances, however their effect was supplementary as there were cases where each of these were non-existent and affordances still emerged. For example, in a laboratory some information could only be sensed by using a microscope available to every microbiologist (influence of subject and inputs but no rules, division of labour or community) (C11).

6.2.1.3 Manipulation Affordances

Manipulation affordances relate to handling objects using our bodies and emerged in the experiences of all co-researchers. In some cases they were discussed directly,
for example a dentist pressing a pedal, a baker cutting the dough, a timber trader turning the log around, and a machinist opening a toolbox. In others it was implied in co-researchers’ stories, for example people could not work with instruments and technology unless they turned on the computer, UV lamp, oven, safety cabinet or projector.

Manipulation affordances emerged frequently within the process when process inputs have to be worked upon (see section 5.3.5.5.4). Knowledge, rules and the division of labour had a clear impact on manipulation affordances as they determined who: knew (see section 5.3.5.1.5), was allowed (see section 5.3.5.6.4), or was scheduled to perform manipulation (see section 5.3.5.7.4). For example, some machinists did not know how to operate the equipment to manufacture specific precision machinery (C14), and some employees did not have access to specific premises and were unable to manipulate the equipment located there (C6). Occasionally manipulation affordances could also be facilitated by interacting with others (see section 5.3.5.7.4). For example, a bakery manager could not cut the dough in the required time and would request the help of other bakers. Manipulation affordances in turn facilitated the performance of specific functions and through that advanced many aspects of business processes contributing to effectiveness and efficiency. For example, by dialling the number for a teleconference meeting, collaboration between people was enabled and they could exchange useful information during process enactment.

Through reflection on the experiences of different co-researchers with manipulation affordances I established that process subject and inputs had an essential influence on such action opportunities as their impact was present in every instance of the manifestation of such affordances. Rules, stakeholders and the division of labour had the potential to impact affordances, however, their effect was supplementary. That is, there were cases where each element was non-existent and affordances would still emerge. For example, a dentist pressed a pedal to perform dental procedure (influence of subject and inputs but no rules, stakeholders or division of labour) (C1).
6.2.1.4 Summary

Some themes discussed by co-researchers had the potential to facilitate or constrain physical affordances. For example, human capabilities facilitated sensory and manipulation affordances, human interactions assisted sensory affordances, human culture enabled layout affordances, rules aided layout and manipulation affordances, and finally process inputs as well as division of labour facilitated all physical affordances. Physical affordances on the other hand enabled or hindered some themes discussed by co-researchers. For example, layout affordances facilitated human capabilities, motivation, and interactions, while all physical affordances had the potential to affect process attributes such as effectiveness and efficiency.

Some physical affordances emerged in the experiences of all co-researchers. The most visible in discussions were layout affordances (Gibson 1979) linked to the spatial arrangements of process inputs. Manipulation (Gibson 1979) and sensory (Heft 2001) affordances were rarely discussed as people were more interested in the higher-level purpose of their actions rather than operations they had to perform to get there. In other words, they did not talk about pressing a key or button but about preparing the report. Manipulation and sensing the information was embedded in using specific instruments and frequently became unnoticeable to participants. This confirms the findings that people do not want to use the equipment but they want to accomplish their tasks (Norman 1990).

Reflecting on the experiences of different co-researchers of physical affordances I established that process subject and inputs had an essential influence while rules, community and division of labour had a supplementary influence on the manifestation of such action opportunities. Looking at the adjusted AAF model presented in Figure 6.1 we can clearly see that physical affordances (triangle A) are spatially linked to process subject and inputs which agrees with my findings about the essential influence of these elements.

The importance of the process as a whole was clearly evident in the experiences of co-researchers. For example, each machine used in the manufacturing process could
be located well on its own but it was only when the machines were placed according to the process workflow that layout affordances emerged and made the work easier and more efficient. Sensory affordances facilitated gaining information during one process task which in turn made performance of other tasks easier, and ultimately enabled more effective and efficient process enactment. This is illustrated by the dentist for whom a digital image improved the diagnosis and made the resulting treatment more accurate. Finally, manipulation affordances often emerged by performing consecutive steps or tasks on different machines. This reflected the progressive nature of business processes. Such sequential manipulation affordances (Gaver 1991) are illustrated by a baker who had to turn on the prover, open the door, put dough inside, close the door, and only then could he press the required sequence of buttons to set up the bread to start proving.

6.2.2 Psychological Affordances of Business Processes

Psychological affordances pertain to the internal aspects of our actions as individuals and are influenced by our human capabilities. The psychological affordances of business processes experienced by co-researchers included: cognitive, motivational and emotional affordances.

6.2.2.1 Cognitive Affordances

Cognitive affordances of the process relate to people being aware of how to perform the required steps and having the necessary information for further process enactment. Such affordances or lack of them emerged in the experiences of all co-researchers. Some examples discussed by co-researchers included: a receptionist knew dental supplies well and organised purchase orders (C1); an ERP customer did not know how to run the system (C2); a bakery manager comprehended what colour and size of specific bread was required to ensure good quality (C7); a product designer acquired an enormous amount of information through face-to-face meetings with the clients (C10); a sales engineer did not know how to answer potential customers’ questions (C13); and an accountant possessed tacit knowledge
that could not be passed to others (C16). In other cases, the manifestation of
cognitive affordances was implied. For example, nail technicians bypassed proper
procedures and caused infections (C4); electricians made mistakes and were
accidentally electrocuted (C12); and a sales engineer learnt about Programmable
Logic Controllers that could be used in their products (C13).

Cognitive affordances were facilitated or constrained by capabilities, knowledge,
experience, and learning (see section 5.3.5.1.1); collaboration (see section 5.3.5.3.1);
language (see section 5.3.5.4.1); technology, information, documentation, and
changes (see section 5.3.5.5.1); and the variety and clarity of rules (see section
5.3.5.6.1). It is worth noting that while new technology could facilitate cognitive
affordances, in some cases it could constrain it. For example, an IT security manager
complained about Facebook-like systems that introduced a deluge of information
which confused people and wasted their time.

“We are moving to the Cloud and moving to the new ways of communicating
(…) so people are joining or subscribe to particular distribution lists (…) I like
the idea of communicating with someone rather than broadcasting to
everyone (…) although it may be efficient in deploying information to as many
people as possible in many cases this information is (…) meaningless to many
people in a group who read it or it is completely useless.” [C6 47-49]

Cognitive affordances in turn facilitated motivation (see section 5.3.5.2.1); good
management and ownership (see section 5.3.5.7.1); and ultimately could make
processes more effective and efficient. For example, a sales engineer was motivated
by gaining an understanding of a new technology learnt during a company-sponsored
training course (C13). A machinist complained about managers not being able to
solve problems due to their lack of knowledge of the manufacturing floor (C14). A
planner could not use the system as she did not comprehend basic material
requisition concepts (C3).

Reflection on the experiences of different co-researchers with cognitive affordances
allowed me to establish that only the process subject had essential influence on such
action opportunities. Depending on the specific circumstances, instruments, rules, stakeholders and the division of labour had the potential to impact affordances but their effect was supplementary as there were cases where each of these were non-existent and affordances still emerged. For example, teachers and accountants were required to participate in regular training (influence of subject and rules but no inputs, division of labour or community) (C15, C16). A manufacturing employee could not setup items in the MRP system as she did not understand basic planning concepts (influence of subject and inputs but no rules, stakeholders or the division of labour) (C3).

6.2.2.2 Emotional and Motivational Affordances

There was a very strong link between emotional and motivational affordances. In section 5.3.5.2.2, I mentioned that people were happy (emotional affordances) when they were motivated (motivational affordances). On reflection I realised that the relationship also works the other way around, meaning people are motivated (motivational affordances) when they are happy (emotional affordances). Intertwining emotions and motivation prompted me to deal with both affordances at the same time.

Emotional affordances relate to our reaction to the events in our lives, and in the context of business processes ranged from very positive to very negative ones. It is worth noting that people have positive and negative emotions related to work and it is not therefore a matter of enabling or hindering emotional affordances but enabling positive emotions and hindering negative ones. Motivational affordances relate to supporting our motivational needs and for some co-researchers (C2, C11) were crucial in aligning process subjects’ goals with the objective of the business.

Emotional and motivational affordances or lack of them emerged in the experiences of all co-researchers. Emotions were discussed directly as people had opinions on their specific experiences and used positive and negative language to express it.
“It improved my life a lot.” [C1 150]

“Management ignored it and (...) that frustrated the whole team.” [C2 201]

“I hate computers.” [C4 82]

“The open space – we love it.” [C6 96]

“That’s the biggest enjoyment.” [C9 95]

“I’m happy with that course.” [C13 51]

“In the beginning I didn’t like it but now I can see (...) it takes a lot of stress from us.” [C14 16]

“The technology we have today is really – it’s amazing.” [C15 31]

Motivation was in some cases also discussed directly. For example, employee motivation in an ERP consultancy firm ran low (C2); a beautician was motivated when a manager adjusted the process to follow her recommendation (C4); in the shipping arm of a global mining corporation the manager scheduled the work according to what motivated specific employees (C5); a bakery manager was motivated by the constant challenge in her work (C7); a timber salesman was motivated to work hard when others praised the work of his son (C9); monotonous work was less motivating for microbiologists (C11); and an electrician was motivated by working every day at different places (C12). In other instances, however, motivation was implied rather than discussed directly. For example: a global manufacturing company had a career progression policy to ensure that the business gets as much benefit from employees as possible, but quite likely such a policy also motivated employees (C3). In an IT corporation people’s unhappiness was reflected in their work, suggesting that they were demotivated to work well (C6). In a not-for-profit organisation some employees were enthusiastic and liked to work with older people, indicating that such work motivated them (C8). An accountant’s job at school became part of her lifestyle within the local community and brought her great satisfaction, suggesting strong motivation (C16).

Emotional and motivational affordances were facilitated or constrained by knowledge, learning, human errors, process bypassing and people involvement, (see
sections 5.3.5.1.2, 5.3.5.1.3, 5.3.5.2.2, 5.3.5.2.3); challenge and satisfaction (see section 5.3.5.2.3); collaboration, interactions and meetings (see sections 5.3.5.3.2, 5.3.5.2.2, 5.3.5.2.3); culture (see section 5.3.5.4.2); changes, instruments and technology (see sections 5.3.5.5.2, 5.3.5.2.2, 5.3.5.2.3); rules reasonableness, variety, clarity and safety (see section 5.3.5.6.2); and planning, management, monitoring and stakeholders’ conflict (see sections 5.3.5.7.2, 5.3.5.2.3). Emotional and motivational affordances on the other hand enabled or hindered satisfaction and motivation (see section 5.3.5.2.2, 5.3.5.2.3); ownership (see section 5.3.5.7.2); and ultimately could improve customer service, quality and make processes more effective and efficient.

By reflecting on the experiences of different co-researchers with emotional and motivational affordances I established that only the process subject had essential influence on the manifestation of such action opportunities. Depending on the specific circumstances, instruments, rules, stakeholders and the division of labour had the potential to impact affordances but their effect was supplementary. That is, there were cases where each element was non-existent and affordances would still emerge. For example, a deterioration in facilities fostered negative emotional affordances and hindered motivational affordances (influence of subject and inputs but no rules, division of labour or community) (C6). ERP consultant and machinist were frustrated and demotivated by bad management (influence of subject, stakeholders and the division of labour but no inputs or rules) (C2, C14).

6.2.2.3 Summary

Some themes discussed by co-researchers had the potential to facilitate or constrain psychological affordances. For example, human culture facilitated cognitive affordances; the division of labour assisted emotional and motivational affordances; and finally human capabilities, interactions, process inputs, and rules facilitated all psychological affordances. Psychological affordances on the other hand enabled or hindered some themes discussed by co-researchers. For example, cognitive affordances facilitated human motivation and the division of labour. All types of psychological affordances had the potential to influence process effectiveness and
efficiency by: helping people to be aware of what to do and how to do it; motivating people so their goals were aligned with business objectives; and encouraging positive emotions in people so they could concentrate on work rather than being side-tracked by unnecessary disturbances.

Psychological affordances emerged in the experiences of all co-researchers. While instances of the emergence of cognitive (Hartson 2003) and motivational (Barentsen & Trettvik 2002) affordances were either discussed directly or implied, emotional affordances (Zhang 2008) were always mentioned directly. People expressed their opinions by using positive or negative language to describe their experiences.

Through reflection on the experiences of different co-researchers in relation to psychological affordances I established that only the process subject had an essential influence while instruments, rules, stakeholders and the division of labour had a supplementary influence on the manifestation of such action opportunities. Looking at the adjusted AAF model presented in Figure 6.1 we can clearly see that psychological affordances (middle triangle C) are spatially matched to process subject which agrees with my findings about the essential influence of this element.

The psychological affordances emerging in the co-researchers’ experiences illustrate the importance of the process as a whole. Human involvement in the process introduced dependence on people’s cognition, motivation and emotions typically present during their actions. Knowledge of a whole process had clear benefits and many co-researchers directly expressed a need for people to be more comprehensively trained, as this would ensure that the tasks are performed more efficiently and reliably (C7, C9, C11, C14).

6.2.3 Social Affordances of Business Processes

Social affordances relate to our lives within social groups with structures, conventions and dynamics that influence our actions. As many processes were performed by multiple individuals and teams, there was the potential to build relationships with others and maintain inter-personal interactions. The social affordances of business
processes experienced by co-researchers included interactional and cultural affordances.

6.2.3.1 Interactional Affordances

Interactional affordances are concerned with the social relationships around us, and emerged in the experiences of all co-researchers. The level of interaction was highest in large corporations where people interacted face-to-face or through technology. In small businesses such interactions happened mainly face-to-face and occasionally over the phone. People’s relationships in small organisations tended to be closer (C4, C7, C9, C15, C16), as the division of labour was less strict so tasks were more frequently shared with others (C1, C4, C7). In some cases co-researchers’ work was relatively independent but even then some reliance on other’s input was required (C4, C16). Interestingly, some people expressed a preference to work alone, arguing that others disturb their work rather than help. For example, a beautician was sometimes interrupted by hairdressers when selling beauty products to customers (C4); a machinist preferred to work night shifts as there was no administrative staff interfering with his work, and as a result he could finish the jobs quicker (C14).

Interactional affordances in co-researchers’ experiences were facilitated by: knowledge, experience, and human errors (see section 5.3.5.1.4); collaboration, communication, interactions, meetings, and trust (see section 5.3.5.3.3); culture and language (see section 5.3.5.4.3); physical layout, technology, information, and documentation (see section 5.3.5.5.3); and monitoring and stakeholders’ conflict (see section 5.3.5.7.3). At the same time interactional affordances enabled knowledge, information, and learning (see section 5.3.5.1.4); collaboration and trust (see section 5.3.5.3.3); motivation and satisfaction (see section 5.3.5.2.4); and ownership (see section 5.3.5.7.3).

Process inputs through technology mediated the subjects’ actions aimed at achieving the process objective and facilitated the emergence of interactional affordances. For example, the teleconference system enabled interactions between people located in
different geographical zones (C3, C5, C6, and C10). At the same time interactional affordances could affect process inputs by assisting people to gain knowledge and create documentation. For example, through interactions with other experts around the globe, the IT corporation created extended documentation on the relevant processes (C6). Rules through cultural norms mediated interactions between process subject and stakeholders. For example, employees in Japan did not question managers’ decisions (C5). The division of labour hindered interactions through workplace monitoring and stakeholders’ conflict but could also facilitate interactions through increasing people’s ownership of their work. For example, employee monitoring introduced in an ERP company resulted in a loss of trust and less-friendly relationships in the workplace (C2). Finally, process stakeholders taking part in interactions also contributed to the emergence of affordances. For example, salespeople interacted with customers (C7, C13), and machinists talked to the managers when tools required for a job were not available (C14).

Reflecting on the experiences of different co-researchers with interactional affordances I established that process subject and stakeholders had an essential influence on such action opportunities. While instruments, rules and division of labour had the potential to impact affordances, their effect was supplementary. That is, there were cases where these elements were non-existent and affordances would still emerge. For example, a teleconference system enabled employees to communicate around the globe (influence of subject, instruments and stakeholders but no rules and the division of labour) (C3, C5, C6, C10). Weekly stand up meetings in an ERP company facilitated interactions between employees (influence of subject, rules and stakeholders but no inputs and the division of labour) (C2).

6.2.3.2 Cultural Affordances

Culture refers to the shared values embraced by a group of people, such as a nation, an organisation, or a work group (Leidner & Kayworth 2006) and determines the objectives of human action and human perception of the relevant symbols and
representations (Barentsen & Trettvik 2002). Many affordances that emerged during the business process enactment were therefore cultural.

“The important things around culture are the way you communicate different types of information, the way decisions are made and the way that you form relationships and develop relationships in that culture.” [C10 60-62]

Cultural affordances relate to sharing goals and practices with others by “living” in the same space and “growing into” using the same objects and following common patterns of behaviour. Such affordances or lack of them were discussed by the majority of co-researchers. An IT director (C3), a beautician (C4), a fleet manager (C5), an IT security manager (C6), a bakery manager (C7), a product designer (C10), a microbiologist (C11), and an electrician (C12) talked about conflicts that arose at their workplaces due to cultural differences of process subjects, such as varied attitudes to hierarchy, dissimilar ways of doing things, and different languages. A not-for-profit manager (C8), a timber salesman (C9), a sales engineer (C13), and an accountant (C16) stressed the importance of understanding the different cultures of their customers. Finally a machinist (C14) mentioned his workplace rule of not speaking in other than the English language to ensure that people do not feel outside the group.

Some co-researchers did not discuss the manifestation of cultural affordances. A reason could be that in their work context cultural conflict did not arise and such action opportunities were taken for granted. For example, a dentist (C1) worked in a small practice where all employees spoke fluent English and had worked in Australia for years. An ERP consultant (C2) worked with clients where the workforce was predominantly Australian (regional councils) or had at least worked in Australia for years.

For co-researchers experiences of cultural affordances were facilitated by: knowledge and learning (see section 5.3.5.1.4); interactions, collaboration, communication and trust (see section 5.3.5.3.3); culture and language (see section 5.3.5.4.3); historically developed rules within the relevant community, for example safety (see section 5.3.5.6.3); and management mitigating stakeholders’ conflict (see
Cultural affordances in turn influenced: people capabilities (see sections 5.3.5.1.4 and 5.3.5.4.3); satisfaction and motivation (see section 5.3.5.2.4); interactions, collaboration, communication, and trust (see section 5.3.5.3.3); physical layout (see section 5.3.5.5.3); compliance with established rules (see section 5.3.5.4.3, 5.3.5.6.3); attitudes to power and stakeholders’ conflict (see sections 5.3.5.4.3).

Reflection on the experiences of different co-researchers with cultural affordances allowed me to establish that process subject and stakeholders had an essential influence on such action opportunities. Process stakeholders were essential since instruments and understanding were shared with them or conflict occurred between them. While instruments, rules and the division of labour had the potential to impact affordances, their effect was supplementary as there were cases where each of these were non-existent and affordances still emerged. For example, workers in Thailand rejected an MRP system (influence of subject, inputs and stakeholders but no rules and division of labour) (C3). Protecting customers from harm was a common practice in Australian companies (influence of subject, rules, and community but no inputs and division of labour) (C2, C4, C7).

6.2.3.3 Summary

All themes discussed by co-researchers had the potential to facilitate or hinder social affordances and at the same time were enabled by such affordances. This confirms one of the premises of Activity Theory discussed in section 2.4 (Vygotsky 1978) that culture not only shapes our actions but is also continuously developing through time under the influence of environment and people. Cultural affordances were quite diverse and related to a range of opportunities that people were attuned to through their culture. This could include how specific requirements were understood, how interactions with others took place, what provided motivation, how instruments and technology were used, and how rules and instructions were followed.
In this study, business processes were always designed to achieve a specific objective, and process outputs were always produced as a collaborative effort (even if a specific process step was assigned to one individual) and were of benefit to some customer. For that reason all co-researchers were exposed to interactions with others during process enactment in their workplace. Some interactional affordances (Pols 2012) emerged directly within the process while others could be enabled by events happening outside the process. For example, a social event after business hours could encourage team building and allow people to learn about each other and trust each other during future work (C10, C16). While every person is moulded by the culture they are raised in, cultural affordances (Barentsen & Trettvik 2002) were not always specifically discussed. One of the reasons could be that in organisations employing people whose social knowledge was similar, cultural conflicts did not arise and therefore no specific problems, for example language, had to be addressed.

Through reflection on the experiences of different co-researchers with social affordances I established that process subject and stakeholders had an essential influence while instruments, rules and the division of labour had a supplementary influence on the manifestation of such action opportunities. Looking at the adjusted AAF model presented in Figure 6.1 we can see that while social affordances (triangle D) are spatially matched to process stakeholders, they are not spatially linked to the process subject. This particular problem was addressed during synthesis (see section 7.1) and contributed to a significant transformation of the model.

Many examples of social affordances emerging in co-researchers’ experiences illustrate the importance of the process as a whole. Many processes required the involvement of multiple individuals or teams working on different tasks, and it was crucial to ensure that they all worked towards common objectives. This could only be achieved when process stakeholders were able to share relevant information, knowledge and common understanding of situations and events happening during process enactment. Social affordances enabling process subjects’ interactions, and “social knowing” (Valenti & Gold 1991) played an important role in ensuring that people’s actions were coordinated and conflicts minimised.
6.2.4 Functional Affordances of Business Processes

Functional affordances relate specifically to man-made artefacts designed with a specific function in mind. Many human creations are designed to fulfil a predetermined objective and business processes are no exception. Design of specific aspects of the process can provide functional affordances that facilitate people’s actions to achieve process goals. While the literature provides many examples of functional affordances of the instruments (Gibson 1979; Norman 1988) there are many other man-made creations used within the process that are aimed at fulfilling a specific purpose. For example, physical layout (Gibson 1979) of the space creates spatial relationships between process instruments and could be used to achieve a specific purpose such as improved learning and collaboration. Another example is including specific process events or steps such as regular team meetings to further learning and exchange of information. Finally, process division of labour and rules can be introduced to monitor the work or ensure its safety.

The findings of this study showed that to achieve the desired objective many low-level actions needed to be performed. Within the context of a business process functional affordances were often sequential in time (Gaver 1991). Such opportunities could be revealed by the trigger of a low-level action, which via a chain of inter-linked affordances could lead to the execution of a high-level and functionally meaningful action. For example, the dentist could pick up the intra-oral camera, press a dental chair pedal to take the picture, which was then sent to the computer and displayed on the screen so it could be emailed through special software to the technician for making a crown. Pressing a pedal when there was no patient on the chair, or using the intra-oral camera when it was not aimed at a tooth, or the computer was not turned on, had little effect and was just senseless movement. As discussed in section 2.4, it is precisely the historically developed sense of our actions, with all the goals we aim to achieve and all the communities we participate in, that makes us human (Vygotsky 1978).

Functional affordances of processes were facilitated by human capabilities and process inputs as abilities determined if people were aware of how and what to do
with the process inputs in order to create the required outputs (see sections 5.3.5.1.5 and 5.3.5.5). For example, ERP system users could not follow the payroll process due to low capabilities (C2). Another enabler of functional action opportunities was motivation, as satisfied people were more focused on their work and more likely to use the instruments properly (see section 5.3.5.2.5). For example, employees in a global IT corporation were dissatisfied and their effectiveness decreased (C6). Human interaction could also assist the manifestation of functional affordances as some system functionalities could only be achieved when people collaborated with each other (see section 5.3.5.3.4). For example, a purchase order entered by a clerk could only be approved by the purchase manager (C2). Finally, culture through influencing how rules introduced with the specific function in mind were followed (see section 5.3.5.4.4); how rules made through legislation make employees safe (see section 5.3.5.6.4); and the division of labour through monitoring to ensure that steps are performed on time and the relevant documentation is created (see section 5.3.5.7.4), also had the potential to facilitate functional process affordances. For example, Koreans followed the rules without questioning (C5), safety regulations were introduced to deal with fatalities in the electrical industry (C12), and an ERP system monitored key performance indicators (KPIs) for property maintenance jobs (C2).

At the same time the functional affordances of processes had the potential to enhance human capabilities by enabling people to learn (see section 5.3.5.1.5) and motivation as people were better satisfied when instruments worked properly (see section 5.3.5.2.5). For instance, flowcharts made apprentices aware of how to bake bread (C7) and microbiologists were frustrated when computers froze (C11). Functional affordances could also enable interactions (see section 5.3.5.3.4) as instrument functionalities assisted people in communicating around the globe. For example, a product designer communicated with overseas customers via a teleconference system (C10). Process rules were another element enhanced by functional affordances as instruments functionality could assist in compliance (see section 5.3.5.6.4). For instance, thermometers were used in a bakery to check the temperature of some ingredients, such as cheese, to ensure that products would be safe for customers to eat (C7). Finally, functional affordances facilitated the division of labour (see section 5.3.5.7.4). For example, information system functionality
planned the distribution of resources, monitored the work of process subjects, and facilitated management decisions (C2, C3).

Functional affordances emerged in the experiences of all co-researchers. Such affordances were discussed directly when elements of the process had specific functions to fulfil. Some co-researchers talked about introducing new instruments and technologies with specific functionalities not previously available (C1, C3, C4, C5, C6, C7, C8, C9, C10, C11, C12, C13, C14, C15, and C16). Others mentioned the importance of collaborative tools, such as meetings, which enabled the sharing of information and knowledge (C2, C6, C10, and C15). There were also those who stressed the importance of specific rules, such as safety or security, in fulfilling the required function, for example to keep the company data secure (C1, C3, C5, C7, C8, C11, and C12).

By reflecting on the experiences of different co-researchers with functional affordances I established that process subject and inputs had an essential influence on such action opportunities. While rules, community and division of labour had the potential to impact affordances, their effect was supplementary. That is, there were cases where each element was non-existent and affordances would still emerge. For example, a machinist used the equipment to build high precision machinery (influence of subject and instruments but no rules, stakeholders or division of labour) (C14).

Looking at the adjusted AAF model presented in Figure 6.1 we can clearly see that while functional affordances (triangle B) are spatially matched to process subject they are not spatially linked to process inputs. This particular problem was addressed during synthesis (see section 7.1) and contributed to significant transformation of the model.

6.2.5 Summary

Reflection on the experiences of co-researchers during process enactment allowed me to establish the importance of the connections between different elements of the
activity system and emerging affordances. Table 6.1 provides the summary of analysis. For each affordance category (physical, functional, psychological, and social) the influence type (essential or supplementary) of each activity system element (process subject, stakeholders, inputs, rules, and the division of labour) is identified. Examples of specific co-researcher experience is provided, with short explanation and identification of affordance type.

Table 6.1: Essentiality of the AAF elements in the emergence of affordances.

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>INFLUENCE TYPE</th>
<th>ACTIVITY SYSTEM ELEMENT</th>
<th>EXAMPLES</th>
<th>EXPLANATION</th>
<th>AFFORDANCE TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical</td>
<td>Essential</td>
<td>Subject</td>
<td>Dentist pressed a pedal (C1)</td>
<td>Influence of subject and inputs but no rules, stakeholders or division of labour.</td>
<td>Manipulation: pressing a pedal</td>
</tr>
<tr>
<td></td>
<td>Supplementary</td>
<td>Rules</td>
<td>Employees in Japan were sitting at their desks in a way that allowed them to face only their manager (C3)</td>
<td>Influence of subject, inputs, rules, stakeholders and division of labour.</td>
<td>Layout: sitting arrangements</td>
</tr>
<tr>
<td>Functional</td>
<td>Essential</td>
<td>Subject</td>
<td>Machinist used the equipment to manufacture bowl ring and shaft to build high-precision machinery (C14)</td>
<td>Influence of subject and instruments but no rules, stakeholders or division of labour.</td>
<td>High precision metal cutting and moulding</td>
</tr>
<tr>
<td></td>
<td>Supplementary</td>
<td>Rules</td>
<td>ERP system monitored process performance (C2, C7)</td>
<td>Influence of subject, instruments, stakeholders, division of labour but no rules.</td>
<td>Monitoring performance</td>
</tr>
<tr>
<td>Psychological</td>
<td>Essential</td>
<td>Subject</td>
<td>Manufacturing employee could not setup items in the MRP system as she did not understand basic planning concepts (C3)</td>
<td>Influence of subject and inputs but no rules, stakeholders or division of labour.</td>
<td>Cognitive</td>
</tr>
<tr>
<td></td>
<td>Supplementary</td>
<td>Inputs</td>
<td>ERP consultant was frustrated and demotivated by weak management (C2)</td>
<td>Influence of subject, stakeholders and division of labour but no instruments or rules.</td>
<td>Emotional Motivational</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rules</td>
<td>Not-for-profit manager was upset when new legislation was coming into effect within two months and it was still not finalised in parliament (C8)</td>
<td>Influence of subject and rules but no instruments, stakeholders or division of labour.</td>
<td>Cognitive and Emotional</td>
</tr>
<tr>
<td>Social</td>
<td>Essential</td>
<td>Subject</td>
<td>Teleconference system enabled shipping employees to communicate around the globe (C5)</td>
<td>Influence of subject, stakeholders and instruments but no rules or division of labour.</td>
<td>Interactional</td>
</tr>
<tr>
<td></td>
<td>Supplementary</td>
<td>Inputs</td>
<td>Protecting bakery customers from harm was a common practice in Australia.</td>
<td>Influence of subject and stakeholders but no instruments, rules or division of labour.</td>
<td>Cultural</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rules</td>
<td>After process redesign the administration staff interacted with employees (pilot study).</td>
<td>Influence of subject, stakeholders and division of labour but no instruments or rules.</td>
<td>Interactional</td>
</tr>
</tbody>
</table>
Visual representation of the findings summarised in Table 6.1 is provided in Figure 6.2. The process subject always determines affordances, as such action opportunities emerge between the subject and their environment. This is illustrated by the parallel horizontal green, yellow, blue and red arrows. Process inputs always influence physical and functional affordances, as demonstrated by the parallel vertical green and yellow arrows. Finally, process stakeholders always impact social affordances as presented by the vertical red arrow.

![Diagram](image)

**Figure 6.2: Essentiality of the AAF elements in the emergence of affordances.**

Specific affordance category triangles are colour coded: physical in green, functional in yellow, psychological in blue and social in red. The arrows in the figure represent different categories of affordance. While green (A) and blue (C) triangles are directly linked to all the existing green and blue arrows, the yellow (B) and red (D) triangles surprisingly are not directly linked to all the yellow and red arrows. What transpires from the analysis in section 6.2 is that some categories of affordances are not
spatially matched to their essential elements in the AAF model. This particular issue will be addressed in the synthesis chapter of my thesis (see section 7.1) and together with other discoveries presented in this chapter (see section 6.4) will lead to the significant transformation of the proposed model.

6.3 Relationships between Affordances

Co-researchers’ experiences indicated that in specific instances it was quite common for multiple affordance categories to emerge. While complex actions were noted as being related to groups of action opportunities, such affordances belonged usually to one or two categories (Gaver 1991). For example, the sequential affordances of a hierarchical drop-down menu were physical (click-ability) and functional (evoking a specific function). In the business process context however there were instances where all four categories of action opportunities manifested themselves together. For example, people were happier (emotional affordances) and better motivated (motivational affordances) when new instruments made their work easier (functional and physical affordances), they could interact with others (social affordances), they could learn (cognitive affordances) and rules were clear (cognitive affordances). When people were not aware of what to do within the process (lack of cognitive affordances) they were frustrated (negative emotional affordances). When people were motivated (motivational affordances) they were satisfied and happy (positive emotional affordances).

The simultaneous emergence of affordances raised the question of whether action opportunities themselves may be connected strongly enough to enable each other. Results of reflection on this question are presented in the insights that follow.

Layout affordances enabled psychological, functional and social action opportunities. For example, an open layout enabled cognitive affordances through learning (C5, C6); a closed layout made data secure (C16); and an open layout encouraged people to interact (C5, C6, C16). Sensory affordances contributed to psychological action opportunities. For example, information improved people’s knowledge (C1). Manipulation affordances assisted psychological and functional action opportunities.
For example, people were upset when they could not manipulate instruments easily (C4); and specific instruments could only function when they were manipulated (C1, C4).

At the same time, layout affordances were influenced by social action opportunities. For example, the culture in Japan determined where managers and workers sat. Sensory affordances were facilitated by functional affordances. For example, instrument functionalities enabled the sensing of some information (C10, C11). Manipulation affordances were assisted by psychological, social and functional action opportunities. For example, machinists manipulated equipment when they knew how to do it (C14); cutting dough in the required time was only possible by involving other people (C7); and rules such as permissions allowed programmers to adjust the code that required manipulation to type on the computer (C6).

Cognitive affordances enabled physical, functional, emotional, motivational and social affordances. For example, machinists manipulated and used equipment when they knew how to do it (C14); ERP system users were frustrated when they did not know how to use the system. (C2); and Filipino workers did not share a common understanding with Korean managers, and the cultural conflict strained their relationships (C3). Emotional and motivational affordances facilitated cognitive and social action opportunities. For example, staff in a global IT corporation concentrated better when they were motivated (C6); hairdressers interacted better with others when they were happy (C4).

At the same time, cognitive affordances were assisted by physical and functional action opportunities. For example, employees: could sense information through the use of specialised instruments, such as an electron microscope (C10, C11). Cognitive affordances could also be facilitated or hindered by emotional, motivational and social action opportunities. For instance, employees concentrated better when they did not have frustrating disturbances, such as freezing computer screens (C11). Such employees gained knowledge from others during meetings (C2, C5, C6, C10, and C12). Emotional and motivational affordances were contributed to by physical, functional, cognitive, and social action opportunities. For example, a beautician was frustrated
when a UV lamp did not work properly (C4); ERP system users were upset when they did not know what to do (C2); and a microbiologist was happy when she could interact with others (C11).

Interactional affordances contributed to physical, psychological, cultural, and functional action opportunities. For example, some manipulations such as cutting the dough in the required time were only possible with others’ help (C7); people shared knowledge and information during meetings (C2, C5, C10); interactions with others contributed to a common understanding of process goals (C2); and people created instruments together, such as documentation on agile processes in a global IT corporation (C6). Cultural affordances assisted physical, functional, psychological, and interactional affordances. For example, a dentist cleaned the drills differently from other Australian professionals (C1); Dutch customers shared a common understanding of processes, goals and events with Australian product designers but not with French owners (C10); and cultural conflict between Filipino workers and Korean managers led to deteriorated interaction (C5).

At the same time interactional affordances were enabled or constrained by physical, functional, psychological, and cultural affordances. For example, people interacted using technology such as a teleconference system (C5, C6, C10); a beautician interacted better with others when she was happy (C4); the employees of a salon did not interact well with a hairdresser who did not speak English (C4). Cultural affordances were assisted by physical, functional, psychological, and interactional action opportunities. For example, people used instruments and their functionalities, such as an ERP system, with others to achieve common objectives (C2, C3); knowledge about different cultures mitigated cultural conflicts (C5); and interactions between administration staff and employees furthered common goals and improved the accuracy of timesheet entries (pilot study).

Functional affordances emerging in co-researchers’ experiences were facilitated by and at the same time enabled all other categories of action opportunities. Physical, psychological and social affordances contributed to the creation of opportunities for realising a specific purpose. Functional affordances at the same time could assist
physical, psychological, and social action opportunities. For example, instrument functionality enabled manipulation not otherwise possible, such as very high-precision metal cutting (C14); laboratory employees were dissatisfied and demotivated when instruments did not function properly, such as computer screen freezing (C11); and teleconference system functionalities could enable interactions over long distances (C5, C6, C10).

A visual representation of the relationships between different affordance categories emerging during business process enactment is represented in Figure 6.3. Red arrows are added to the adjusted AAF to show the direction of the links encountered in coresearchers’ experiences.

Figure 6.3: AAF model illustrating relationships between affordances.

The simultaneous emergence of affordances suggests that in a specific context a specific category of action opportunity may play more of a central role than the others. I labelled such affordance primary to reflect its essential nature, while the
remaining categories became secondary to reflect their supplementary character. In my adopted model (see section 2.5) the business context is determined by the activity system elements, such as the process subject, inputs, stakeholders, rules and the division of labour. It was therefore those elements that I turned my attention to in order to determine primary and secondary affordances.

### 6.4 Primary and Secondary Affordances

Sections 6.2 and 6.3 looked into business process enactment from an affordances point of view. In these sections specific affordances and their manifestation were studied through an analysis of all common codes and themes. Additionally, these sections looked into relationships between action opportunities themselves. What clearly transpires from my analysis so far is the interdependence between the manifestation of every category of action opportunity and all themes. While some association could be weak, the possibility of a relationship was there. While previously I looked for the most important elements of the activity system (and research themes related to them) and for specific affordances, in this section I will look into the most important affordance for each activity system element (and research theme related to it). I will therefore explore process enactment from a different angle by studying the connections between each theme and specific affordance category in order to establish the most important links.

Looking at different affordances influencing and being influenced by specific themes, I noticed that some affordances were **primary**, meaning necessary for other action opportunities to emerge, or they were the only reason for other affordances to be used. For example, when regular meetings to share knowledge were built into the process, social affordances emerged before cognitive ones, as people had to interact first before they could learn from each other. In another example, the physical affordances of a dental chair were only used to evoke functional affordances, as the dental chair pedal was pressed only to take a photo with an intra-oral camera.

The Primary affordances facilitated by human capabilities and human motivation were psychological. It was only when people were aware of what to do and how to
do it (psychological cognitive affordances) that they could perform physical operations (facilitated by physical affordances), interact with others (enabled by social affordances), and fulfil the specific objective (assisted by functional affordances). Similarly, it was only when people were motivated (psychological motivational affordances) that they performed physical operations properly (facilitated by physical affordances), interacted with others well (enabled by social affordances), and fulfilled the specific objectives in an effective and efficient manner (assisted by functional affordances).

The primary affordances facilitated by human interactions and human culture were social. When people interacted with each other (social interactional affordances) they exchanged their knowledge (psychological cognitive affordances and functional affordances) and were satisfied (psychological motivational and emotional affordances). Similarly culture (social cultural affordances) determined how people set out the working space (physical layout affordances), how they used the instruments (physical manipulation and functional affordances), how they were motivated (psychological motivational affordances), and how they interacted with each other (social interactional affordances).

The primary affordances facilitated by process inputs, rules and division of labour were functional. This is not surprising considering that a process is created with a specific objective in mind. For example, a dental chair pedal could be pressed any time but it was only when the patient was sitting in the chair and the intra-oral camera was aimed at a tooth that pressing the pedal performed a meaningful action. This operation created a digital image which was later communicated to the technician, who made the crown which could be fitted by the dentist. While physical (manipulation by pressing the pedal), psychological (knowledge required to use the camera), and social (communicating with the technician) affordances emerged within the process, functional affordances were pivotal in these human actions. Table 6.2 lists primary and secondary affordances with examples for each theme.
Table 6.2: Primary and secondary affordances associated with different themes.

<table>
<thead>
<tr>
<th>RESEARCH THEME</th>
<th>PRIMARY AFFORDANCES</th>
<th>SECONDARY AFFORDANCES</th>
<th>EXAMPLES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human Capabilities</td>
<td>Psychological Cognitive</td>
<td>Physical and Functional</td>
<td>Machinist with knowledge of different machines was able to operate them (C14)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Psychological Emotional and Motivational</td>
<td>Lack of knowledge of the ERP system in regional councils frustrated and demotivated employees to use it (C2)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Social</td>
<td>Senior researchers in an IT global corporation with extensive knowledge provided yearly training to other employees where everyone had a chance to meet and interact together (C6)</td>
</tr>
<tr>
<td>Human Motivation</td>
<td>Psychological Motivational</td>
<td>Physical and Functional</td>
<td>Demotivated employees in a pharmaceutical laboratory were not using instruments properly (C11)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Psychological Cognitive and Emotional</td>
<td>Motivated employees in a bakery participated in training (C7)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Motivated employees of a global shipping corporation were happy doing tasks that suited their personality (C5)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Social</td>
<td>Demotivated employees of a global IT corporations did not collaborate as well as they could (C6)</td>
</tr>
<tr>
<td>Human Interactions</td>
<td>Social Interactional</td>
<td>Physical and Functional</td>
<td>Face-to-face interactions with customers in a product design consultancy firm enabled sensing of information not otherwise available (C10), Social events in an accountancy firm improved collaboration (C16)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Psychological</td>
<td>Microbiologists were demotivated and unhappy by not having interaction with customers (C11)</td>
</tr>
<tr>
<td>Human Culture</td>
<td>Social Cultural</td>
<td>Physical</td>
<td>The layout in Japan was determined by culture (C3)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Psychological</td>
<td>People from similar cultures were aware of meanings assigned by others to the world around them and were happier and without cultural conflict (C3)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Social</td>
<td>Interactions between Korean managers and Filipino workers were strained due to the cultural differences in attitude to hierarchy (C5)</td>
</tr>
<tr>
<td>Process Inputs</td>
<td>Functional</td>
<td>Physical</td>
<td>Dental chair pedal could be pressed to evoke a function (C1)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Psychological</td>
<td>Technology used within a process could be too complex for specific people (C11)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Social</td>
<td>A teleconference system enabled people to interact over large geographical distances (C5)</td>
</tr>
<tr>
<td>Process Rules</td>
<td>Functional</td>
<td>Physical</td>
<td>Work clothing for electricians required by legislation physically protected their bodies (C12)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Psychological</td>
<td>The variety of rules frustrated employees of a not-for-profit organisation (C8)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Social</td>
<td>A Food Safety Programme in a bakery was established to ensure public safety (C7)</td>
</tr>
<tr>
<td>Process Division of Labour</td>
<td>Functional</td>
<td>Physical</td>
<td>Planning included the scheduling of specific machines (C14)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Psychological</td>
<td>Weak management in an ERP consultancy firm frustrated employees (C14)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Social</td>
<td>Power assigned to subjects could influence social interaction (C5)</td>
</tr>
</tbody>
</table>
What transpires from Table 6.2 is that some research themes do not match primary affordances in the AAF model. Functional affordances are placed between the process subject and the rules (triangle B in Figure 6.1) but are not visibly linked to process inputs and the division of labour in Figure 6.1. A simplified visual illustration of the problem is presented in Figure 6.4 where arrows indicate primary affordances.

![AAF model illustrating primary affordances of Activity System elements.](image)

The primary affordances for process subjects, and more specifically their capabilities and motivation, are psychological and are directly linked to the psychological affordances triangle (see process subject in Figure 6.4). For process stakeholders, and more specifically their culture and interactions, the primary action opportunities are social and are matched to the appropriate triangle (see process stakeholders in Figure 6.4). Primary affordances for process rules are functional and are directly linked to
the required triangle (see process rules in Figure 6.4). Note that process inputs and
the division of labour with primary functional affordances are not spatially matched
to the functional action opportunities triangle B. This particular issue will be
addressed in the synthesis chapter of my thesis (see section 7.1) and together with
other discoveries presented in this chapter (see section 6.2.5) will lead to the
significant transformation of the proposed model.

6.5 Chapter Summary

This chapter examined the co-researchers’ stories in order to find possible meanings
in their experiences. I used my imagination to view process enactment from different
angles. I determined that the process subject had an essential influence on all
categories of action opportunities while process inputs had an essential influence on
physical and functional action opportunities, and process stakeholders on social
action opportunities. I also discovered the interdependence of all action
opportunities. Finally, I determined that primary affordances for humans engaged in
processes (process subject and stakeholders) were psychological and social, while for
the design of business processes through used inputs, applicable rules and scheduled
division of labour were functional.

Consideration of the possible dynamics of business process affordances allowed me
to determine structural themes, such as essential elements of process affordances
and primary affordances of process enactment activity system elements. The
complexity of the business process environment and emerging process affordances
as well as uncertainty related to human factors influencing process enactment were
revealed. My discoveries prompted me to significantly transform the proposed model
as will be explained in the next chapter (see section 7.1) as well as suggest some
practical advice for process designers (see section 8.2).
7 SYNTHESIS

The current chapter aims at synthesising the knowledge gained from the literature review and data analysis of the pilot study and interviews on the process enactment experiences of co-researchers along the identified textural and structural themes.

The first part of the chapter reflects on the research conducted so far. It addresses the problematic issues identified during the imaginary variation stage (see sections 6.2.5 and 6.4) and transforms the proposed model. In the next section the new model is discussed and an exploration as to how it fits into the existing body of knowledge is provided. The chapter ends with the essence statement on business process affordances.

7.1 Reflection on Research

The current research was conducted by following closely the methodological process of a hermeneutic phenomenological inquiry, detailed in chapter 3. This provided clear advantages. Firstly, I was able to deal with my bias resulting from previous experiences in process design and enactment. Secondly, I could address the distance that existed between co-researchers working in contexts I was not specifically familiar with, and myself. Finally, I was able to gain an understanding and create a uniform view from dealings with multiple participants of the study.

In a literature review (the first cycle of hermeneutic research illustrated in Figure 3.2) I concluded that a business process can be treated as an activity system and human actions performed within a process can be facilitated by considering enabling condition of the environment. Synthesising Activity Theory (Engeström 2000) and the Theory of Affordances (Gibson 1979) allowed me to establish specific aspects of business processes and its rich sociocultural context that play an important role in process enactment. I inferred that different elements of an activity system can facilitate or hinder the emergence of specific affordance categories and suggested
the Affordance Activity Framework discussed in section 2.5 and presented in Figure 2.9.

In a pilot study (the second cycle of hermeneutic research illustrated in Figure 3.2) the preliminary test of the AAF model was conducted. The exercise confirmed that adjustments to business process activity system elements (instigated through the process design changes) assisted the emergence of affordance categories and ultimately improved process enactment. The proposed framework facilitated the visual representation of the process environment, its changes and their effects, and the model was deemed as having face validity and being an appropriate tool for analysing the business process context and emerging affordances.

During the interviews phase (the third cycle of hermeneutic study illustrated in Figure 3.2) I widened the context to which my framework could be applicable by selecting and interviewing a broad range of co-researchers who could share with me a wider range of process enactment experiences. Reflecting on the gathered data during the analysis phase I identified seven themes representing aspects influencing process subjects’ actions during process enactment and consequently process affordances. The themes were mapped to the activity system model by extending process subject with human capabilities and motivation, and process stakeholders with human interactions and culture (see Figure 6.1).

Phenomenological reduction revealed an intricate net of relationships between different aspects of business processes and emerging affordances (see section 5.3). Imaginary variation (illustrated in chapter 6), however, uncovered problematic issues with the graphical representation of my framework (see sections 6.2.5 and 6.4). Firstly, essential elements of some affordances were not spatially matched to the appropriate action opportunities triangles in the model. For example, process inputs did not have a direct link to a functional affordances triangle (triangle B of Figure 6.2) and the process subject did not have a direct link to a social affordances triangle (triangle D of Figure 6.2). Secondly, inputs and the division of labour with primary functional affordances were not spatially matched to the functional action opportunities triangle (triangle B of Figure 6.4).
The complexity and intricate net of relationships between different aspects of business processes and emerging affordances discovered in the empirical part of my study prompted me to abandon the literature review approach focusing on assigning specific affordance categories to the specific elements of the activity system and propose a new model presented in Figure 7.1.

As shown in Figure 7.1, a process subject works in an environment and affordances emerge as the person interacts with various business processes. A specific process is designed with the aim of achieving the planned objective through the utilisation of different inputs to produce the required outputs. Process rules are established and the division of labour scheduled so the different levels of activities with sequential steps can take place during which resources are used and interactions between stakeholders happen. By taking into consideration affordances during the design of the business processes, the process can encourage (prompt for action) participants towards a goal-directed action using inputs and interacting with other stakeholders, resulting in the actual objective and producing a particular impact.
Figure 7.1: Final Affordance/Activity Framework.
The major difference in the new model is that it identifies process design and enactment which were not specifically part of the original AAF framework (see Figure 2.9). Inclusion of process design allowed me to represent all categories of affordances as being influenced by all elements of the activity system (subject, instruments, stakeholders, rules, and the division of labour).

The conceptual framework built to understand the complexities of the design and enactment of business processes (see Figure 7.1) is based on the Theory of Affordances and Activity Theory. Firstly, the Theory of Affordances (Gibson 1979) is reflected in different affordance categories emerging between a process subject and an artefact in the form of business process design. Specific attributes of the process subject (capabilities or motivation) and process environment (determined by process design) facilitate or hinder the emergence of process affordances which in turn enable or deter specific actions. For example, the warehouse employee who is hearing impaired may not be able to hear the sound played upon a receipt of the message (lack of physical sensory affordances) and will not be aware of the need to undertake the required process steps (lack of cognitive process affordances). A simplified version of the proposed model highlighting the elements relating to the Theory of Affordances is presented in Figure 7.2.

![Figure 7.2: Simplified version of the final AAF highlighting the elements relating to the Theory of Affordances.](image-url)
Secondly, Activity System (Engeström 2000) is also reflected in different elements of the conceptual framework presented in Figure 7.1. The process subject performs a goal directed action to achieve the actual objective by enacting the business process through using process inputs and interacting with process stakeholders. Specific inputs and stakeholders, as well as rules applicable to the process and the division of labour scheduled for the process are determined by process design. A simplified version of the proposed model highlighting the elements relating to Activity Theory is presented in Figure 7.3.

![Figure 7.3: Simplified version of the final AAF highlighting the elements relating to Activity Theory.](image)

The novelty of the proposed framework lies in the synthesis of the Theory of Affordances with Activity Theory. Both, used together in process design can facilitate the emergence of different affordance categories which in turn may encourage or discourage an actor from a particular action. Such prompting for action can contribute to the emergence of multiple affordance categories. For example, the functionality of an ERP system (functional process affordances) can be designed to play a sound for a warehouse employee (physical sensory affordances) when the sales department enter a sales order in the system (social affordances enabling collaboration between different departments). This sound can make the warehouse employee aware that the goods need to be picked from the shelf, packed and shipped to the customer (cognitive affordances). A simplified version of the proposed model
highlighting the elements offering a new contribution to knowledge is presented in Figure 7.4.

![Diagram of AAF model](image)

**Figure 7.4: Simplified version of AAF highlighting a new contribution to knowledge.**

As the empirical part of the research revealed, an action performed by the subject may not necessarily lead to the fulfilment of the process planned objective. For example, the laboratory employee who is poorly motivated may not be inclined to perform difficult tests and delay it as much as possible (C11). When the service to the client is delayed customer satisfaction may decrease and no future orders will be made. Differentiation between planned objectives determined by process design and actual objectives achieved through process enactment provides another advantage of the final AAF model (see Figure 7.1) over the original model (see Figure 2.9). This seems appropriate considering the research problem I set myself to address is a mismatch between process design theory and practice.

An important issue discovered during the current research and highlighted in the final AAF model is the close connection between different categories of action opportunities (see the overlapping affordance circles in Figure 7.1). Process affordances are influenced by the properties of a process as determined by a process design and properties of a subject enacting the process. The subject is not separate
from the world he lives in but is a non-divisible part of it. Consequently, it is important to take into account all aspects of human behaviour.

Concentrating on a specific category of action opportunity may only provide a partial solution. For instance, it may not be adequate to design a process with perfectly functioning instruments (physical and functional affordances) that are easy to use (cognitive affordances) when the performance of tasks is monotonous and isolated from other people (lack of motivational and social affordances). It may also not be sufficient to design a challenging process (motivational affordances) where people have to interact (social affordances) and use perfectly functioning equipment (physical and functional affordances) when subjects have no knowledge of how to utilise the available inputs to produce the required outputs (lack of cognitive affordances). Finally, it will also not be satisfactory to design a process where knowledgeable subjects (cognitive affordances) collaborate with others (social affordances) using instruments that are not reliable and often break down (lack of functional affordances). It is paramount therefore that during the process design all categories of affordances are considered.

The proximity of different affordances confirms the importance of psychological and social factors during business process enactment and the need for sociotechnical approaches to process design. For example, the pilot study and interviews indicate that human interactions built into the process can: facilitate social relations (social affordances); enable learning and sharing knowledge (cognitive affordances); motivate people to work towards common objectives (motivational affordances); increase people’s satisfaction (emotional affordances); and prompt people to use specific instruments or follow specific rules (functional affordances). Ultimately such interactions can make processes more effective and efficient and benefit the organisation even though there may be some additional costs associated with them.

The findings of the study, and more specifically the need for a sociotechnical approach to process design, are in agreement with: taking a holistic organisational perspective including personal and cultural aspects related to business processes (Hammer 2010); focusing on cultural and behavioural issues to achieve acceptance
and truly engage people in business transformation (Schmiedel, vom Brocke & Recker 2013); and facilitating more inspiring designs for processes that are both profitable and more humanly satisfying (Krippendorff 2006). Ultimately, utilisation of business process affordances can reduce the need for process bypassing and increase system acceptance.

7.3 The Essence of Business Process Affordances

My understanding of the essence of business process affordances and their utility resulting from my previous experiences, knowledge and current study can be articulated in the following statements:

Business process affordances emerge through the convergence of properties of a process determined by a process design and properties of a person enacting the process. Psychological and social affordances are primarily influenced by a process subject and stakeholders while physical and functional action opportunities are predominantly influenced by process subject, inputs, rules and the division of labour.

By incorporating affordances into process design the process subject can be induced to perform the required action so the planned process objective is met. This can be achieved by: ensuring that the necessary training and knowledge sharing takes place; providing a challenge (psychological affordances); encouraging interaction so that people can feel part of the team and call on others when necessary; mitigating potential cultural conflicts (social affordances); making available reliable inputs with high usability (physical and functional affordances); as well as
establishing uniform and reasonable rules; and scheduling labour with clear ownership of the required tasks (functional affordances).

7.4 Chapter Summary

This chapter synthesised findings from the literature review, pilot study and interviews on business process enactment. It delivered the final AAF framework illustrating interdependencies between process subject, design, affordances and enactment. Reflection on how the proposed framework fits into the existing body of knowledge in the BPM and IS domains culminated in the statement of the essence of business process affordances. The next chapter will evaluate the findings by discussing the proposed framework with professional process designers.
8 EVALUATION

The current chapter aims at evaluating the findings and building a set of guidelines based on those findings that could be used by practitioners to design processes that facilitate human actions during process enactment thus addressing the problem of process bypassing.

The first part introduces four co-researchers who are regularly involved in process design by presenting their personal and professional background. Subsequently, each interview is summarised to describe co-researchers opinion on the affordance categories introduced in the literature review (see section 2.2.2) and the research themes established during the phenomenological reduction (see section 0).

The final part of the chapter explores different solutions advocated by process designers to make processes more natural to follow. The insights are used to build the practitioners’ heuristics providing the set of practical guidelines for designing processes that enable human actions through facilitating the emergence of all affordance categories.

8.1 Evaluation Interviews

Interviews with four co-researchers experienced in business process design were conducted to discuss the findings. The first co-researcher (C17) is a consultant in his late 30s, working for a small company, regularly engaged by businesses to redesign their processes and implement ERP systems supporting such processes. The second co-researcher (C18) is a manager in her 50s, working for a state government department, involved in finance management and regularly exposed to redesign of the processes resulting from implementation of new policies or changes in information systems. The third co-researcher is an IT manager in his 30s, working for a large corporate group providing health services around Australia, responsible for IT infrastructure supporting the operational side of business and regularly involved in implementing new policies, systems and processes. The fourth co-researcher is an
owner/manager in her 40s, selling hardware equipment and regularly involved in process improvement. Table 8.1 summarises the details of the co-researchers who participated in evaluation interviews.

<table>
<thead>
<tr>
<th>Name (Alias)</th>
<th>Current Role</th>
<th>Business Type</th>
<th>Current Role</th>
<th>Experienced Industry</th>
<th>Experienced Processes</th>
<th>Gender</th>
<th>Age</th>
<th>Education</th>
<th>Background</th>
</tr>
</thead>
<tbody>
<tr>
<td>C17</td>
<td>ERP Consultant</td>
<td>Small</td>
<td>Manager</td>
<td>IT</td>
<td>Design, Variety</td>
<td>Male</td>
<td>30s</td>
<td>TAFE</td>
<td>Australia</td>
</tr>
<tr>
<td>C18</td>
<td>Finance Manger</td>
<td>Large</td>
<td>Manager</td>
<td>Finance</td>
<td>Design, Variety</td>
<td>Female</td>
<td>50s</td>
<td>University</td>
<td>Europe</td>
</tr>
<tr>
<td>C19</td>
<td>IT Manager</td>
<td>Large</td>
<td>Manager</td>
<td>IT</td>
<td>Design, Variety</td>
<td>Male</td>
<td>30s</td>
<td>University</td>
<td>Australia</td>
</tr>
<tr>
<td>C20</td>
<td>Owner/Manager</td>
<td>Medium</td>
<td>Manager</td>
<td>Retail</td>
<td>Design, Variety</td>
<td>Female</td>
<td>40s</td>
<td>TAFE</td>
<td>Asia</td>
</tr>
</tbody>
</table>

The next subsections present summaries of the evaluation interviews.

8.1.1 Process Designer – ERP Consultant

The most important aspect of process enactment for C17 was the division of labour, as a clear assignment of roles and responsibilities was crucial to the implementation of any ERP system. C17 confirmed the importance of process inputs and rules without which the correct process output could not be achieved. C17 also assigned high importance to human capabilities as well as people motivation which drove the labour they put into the process enactment. While C17 did not have much exposure, in his experiences, to cultural issues at the workplace, he agreed that in some circumstances this could be something that required attention from the process designers. However, high significance was not given to human interactions, as streamlining the processes through the use of advanced systems limited human relationships within the process. Low priority was also assigned by C17 to the social aspects of processes. This could be explained by his role as an external consultant hired to implement ERP systems. In this role, he focused on automating process steps to make them more efficient.

“The whole idea is to basically streamline the process (...). So interactions would not be something that would be a huge priority. You may want
someone to approve something at some point one way or another, just to make sure that the process is on track but from an interaction perspective that’s not something that we put a big emphasis on.” [C17 32]

C17 agreed that addressing physical, functional, psychological and social aspects within a processes design could improve process suitability for different subjects and limit the problem of process bypassing. He mentioned however that there may be some constraints to utilising such an approach, for example when some process elements, such as the division of labour, were outside your control.

“In my experience and my role I’m normally engaged by the customer to look at the process and the rules. So they themselves look at the division of labour and they do the analysis there. It’s not something so much that I have input into and control of. But definitely I see how it fits within the process but it’s not something I specifically can control within my role.” [C17 156]

Discussion with C17 looked also into specific practical solutions that could be applied to improve process enactment and prompt process subjects to perform the required actions. This included provision of training and opportunities to learn as well as changing process inputs, rules or the division of labour if necessary. More detailed discussion on practical solutions proposed by interviewed process designers is provided in section 8.2.

8.1.2 Process Designer – Finance Manager

One of the most important aspects in process enactment for C18 was rules, as the organisation was frequently audited to ensure that such rules are adhered to.

“In a public accountability point of view they [rules] are important. As I’ve mentioned, we regularly get audited by Victorian Auditor General Office.” [C18 38]
C18 confirmed the importance of process inputs and the division of labour, without which many processes could not be fulfilled. Motivation and opportunities for interactions with other people within the process to enhance collaboration were also seen as important.

“In a large organisation especially it’s important to move around and know who is doing what and how we can, for example deal with things. Sometimes there are urgent matters and we need to prioritise what we need to deliver, not necessarily what the other area needs to deliver. So it’s important, very important to work with other people.” [C18 44]

While human capabilities could be important in some circumstances, work did not necessarily extensively require them.

“People capabilities, it ranges, depends on the project you are working on. Sometimes you have to have an appropriate skills level but sometimes you can just manage around.” [C18 14]

C18 admitted that she did not have much exposure to cultural issues influencing process enactment and therefore discounted the need to address them. In the discussion that followed it became apparent however that she interpreted culture to mean national identity. In widening her interpretation to include organisational culture, she admitted that culture could have a significant influence on processes especially when there was a gap between the cultural expectations of process participants and the actual organisational culture.

C18 agreed that addressing physical, functional, psychological and social aspects within a processes design could improve process suitability for different subjects and limit the problem of process bypassing. Physical aspects, such as workplace layout, were taken into account during the processes designed by her in the workplace. For example, the procurement department was moved closer to the finance department as both functions had to collaborate on a regular basis. Functionalities offered by the
information systems used within the processes were crucial and when process and system adjustments were necessary due to legislative changes, many resources were employed (including contractors) to ensure that such functionalities were available on time.

Discussion with C18 looked also into specific practical solutions that could be applied to improve process enactment and prompt process subjects to perform the required actions. This included provision of training (although she pointed out that in some circumstances this may have to be delayed) and opportunities to learn as well as changing process inputs, rules or the division of labour if necessary. More detailed discussion on practical solutions proposed by interviewed process designers is provided in section 8.2.

8.1.3 Process Designer – IT Manager

According to C19 the success of a process was closely related to human involvement. Therefore, he considered human capabilities, motivation and culture as highly important during the process enactment and agreed that they all should be addressed in the process design. C19 confirmed also the importance of process inputs (especially technology), rules and the division of labour in the process enactment.

“There is a massive human element in processes and if people cannot do something or if they do not want to do something for various reasons, then that has a massive impact on processes. So you need to be able to design something that’s usable and makes sense so that people can further engage with it.” [C19 14]

“The business that I work with has gone through the acquisition process. So there are a number of businesses that have sort of come together and are trying to put systems in place (...). And it has been really challenging because of culture.” [C19 30]
The importance of human interactions, however, was according to C19, highly dependent on the process itself.

“I guess that depends on the process. If it is something that require human interactions then that’s obviously important that you get that right in the process (...). If they feel uncomfortable doing the process then the human interactions would become uncomfortable. That would make them feel less likely to want to do it, motivation reduces.” [C19 24]

C19 agreed that while functional aspects within a process are the key, addressing psychological and social factors within a process design could improve process suitability for different subjects and limit the problem of process bypassing. Although not exposed greatly to physical aspects of the job, he confirmed that in some circumstances they could also be important.

“There is a great value in understanding not only what someone has got to do but how they are feeling about it, what they are thinking about when they are doing it. That definitely fits into efficient process.” [C19 50]

The discussion with C19 also looked into specific practical solutions that could be applied to improve process enactment and prompt process subjects to perform the required actions. This included provision of training and opportunities to learn as well as changing process inputs, rules or the division of labour if necessary. A complete discussion on practical solutions proposed by interviewed process designers is provided in section 8.2.

8.1.4 Process Designer – Owner/Manager

C20 considered motivation, interactions, rules and the division of labour as important and human capabilities as often important in the process enactment. Specific tasks within business processes were regularly adjusted to ensure that people’s strengths and weaknesses were taken into account. C20 confirmed also the significance of
process inputs without which many tasks had to be performed manually and inefficiently.

“[Human capability] is important in our organisation (...) In the sales department most of our boys need to have product knowledge (...) need to be able to explain to the customer and they need to find out what the customer’s needs are (...) They need to sell the right product to the customer.” [C20 19]

“We use forklift every day to unload trucks. And we had an incident when the forklift was broken (...) so it took us half an hour to unload 2 pallets as opposed to 5 minutes (...). And you can imagine how many trucks come and go on a daily basis so at the end of the day he almost lost half a day on unloading.” [C20 56]

While C20 did not have much experience with cultural issues, even though employees from different cultures worked at her workplace, she agreed that culture may need to be addressed if problems arise.

“I haven’t had one [cultural conflict] before so hopefully I will not run into it. But I agree with what you said, learn and interact.” [C20 84]

C20 agreed that addressing psychological, social, physical and functional factors within the process design could improve process suitability for different subjects and limit the problem of process bypassing. The discussion with C20 looked also into specific practical solutions that could be applied to improve process enactment and prompt process subjects to perform the required actions. This included provision of training and opportunities to learn as well as changing process inputs, rules or the division of labour if necessary. This will be discussed in more detail in section 8.2.

8.1.5 Summary

Four co-researchers regularly involved in business process design (external consultant, two internal managers, and owner/manager) agreed that human
motivation, process inputs, rules and the division of labour were highly important. In some of their workplaces initiatives to increase motivation through a bonus system (C19, C20) or by introducing new inputs through implementation of information systems (C17, C18 and C19) were undertaken.

Human culture was considered as extremely important by an IT Manager (C19) who had experience with merging businesses and the clash of organisational cultures. Similarly, a Finance Manager (C18) encountered problems when new employees joined her department and struggled due to cultural differences. The remaining co-researchers did not have much exposure to cultural issues but believed that they could be important if a cultural conflict between process stakeholders arose.

There was some disagreement about human capabilities. ERP Consultant and IT Manager considered human capabilities as highly important (C17, C19). The remaining co-researchers believed that the relevance of capabilities depends on the nature of the job. For example, to unpack stock from boxes did not require specific skills.

Finally, the biggest discrepancy was visible in human interactions which were highly important for the Finance Manager and Owner/Manager (C18, C20). The IT Manager however believed that the importance of interaction depends on the nature of a job. For example, if an employee is not particularly fond of his work he will be less inclined to interact with others at the workplace (C19). Finally, the ERP consultant considered interactions unimportant and to a large extent eliminated them from the information systems he regularly implemented.

All co-researchers confirmed the significance (human motivation, process inputs, rules and the division of labour) or possible significance (human capabilities, and culture) of the research themes. The only exception was a theme of human interaction which was not important to an ERP Consultant. This particular difference can easily be explained by the nature of the consultant’s work which involved implementation of systems automating business processes. All co-researchers confirmed also that physical, functional, psychological and social aspects of business
processes are important during process enactment. Co-researchers also stated that these aspects comprehensively reflect what should be taken into account during the process design and no new aspects were discussed. Consequently, saturation point was deemed to be reached after four interviews and the evaluation process was finalised.

**Table 8.2: Co-researchers’ opinions on the importance of research themes in process enactment.**

<table>
<thead>
<tr>
<th>CO-RESEARCHER</th>
<th>HUMAN CAPABILITIES</th>
<th>HUMAN MOTIVATION</th>
<th>HUMAN INTERACTIONS</th>
<th>HUMAN CULTURE</th>
<th>PROCESS INPUTS</th>
<th>PROCESS RULES</th>
<th>PROCESS DOL</th>
</tr>
</thead>
<tbody>
<tr>
<td>C17 ERP Consultant</td>
<td>High</td>
<td>High</td>
<td>Low</td>
<td>Depends</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>C18 Finance Manager</td>
<td>Depends</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>C19 IT Manager</td>
<td>High</td>
<td>High</td>
<td>Depends</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>C20 Owner/ Manager</td>
<td>Depends</td>
<td>High</td>
<td>High</td>
<td>Depends</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
</tbody>
</table>

All four co-researchers confirmed that making business processes easier and more natural to follow was for them a worthy cause. The next section describes the practical solutions discussed by co-researchers to ensure that process design creates enabling conditions in the environment and facilitates human actions within process enactment.

### 8.2 Practitioners’ Heuristics

The first practical solution advocated by process designers to make processes more natural to follow was the provision of training and opportunities to learn so subjects are aware of how to use the inputs, what rules to follow, and what actions to undertake (psychological cognitive affordances). Training and learning opportunities could also motivate the subjects to follow the process (psychological motivational affordances).
Another solution to make processes easier to follow related to changing process inputs (including their layouts) and process rules so the functionalities are reliable and delivered in a user friendly manner (physical and functional affordances). Changes in inputs and rules could also enable the required interactions (social affordances) and motivate subjects to follow the process (psychological motivational affordances). For example, a bonus system encouraging teamwork rather than individual performance was praised by the owner manager (C20) and new rules were introduced at her workplace to that effect. As a result process subjects were no longer avoiding activities that were not directly related to selling goods:

“We had the bonus for each individual salesperson but we found out that there was a loophole in this system. Boys stood behind the counter and did not go to the shop to put the stock out. Because when you behind the counter the customer is bound to come to you (...). Now the sales department has got a target and they have to meet it. That target applies to everyone. So if the sales department meets the target for the month, every single person in that department gets a bonus.” [C20 32]

The majority of the co-researchers (C18, C19, and C20) also advocated the provision of opportunities to interact as another possible solution facilitating human actions. Increasing opportunities for beneficial interactions between process subjects and other stakeholders (this included also limiting disruptive interactions) ensured that process subjects share common understanding (social cultural affordances) and are motivated to follow the processes (psychological affordances).

Finally, all co-researchers advocated rearranging the division of labour (see however limitations discussed by C17 in section 8.1.1) to make the performance of specific tasks easier. In some cases radical changes were supported such as retrenching people who cause undesirable conflict:
“You may have to get rid of people who are not consistent with the culture (...). You may have to. There may be some severely negative people who are causing that problem for you.” [C19 84-86]

Insights gained during the interviews helped me to create a set of practical solutions for process designers to facilitate human actions within a process by creating enabling conditions and opportunities to act. The practitioners’ heuristics were developed using a hermeneutical approach as follows. An initial flowchart was prepared after the first 16 interviews and presented during the first evaluation interview. This was discussed and adjusted to encompass new insights and presented at the following interview. The process was repeated and the final version of the practitioners’ heuristics is presented in Figure 8.1 and discussed next.
Figure 8.1: Practitioners' heuristics for designing processes facilitating the emergence of all affordance categories.
Figure 8.1 captures the understanding that when designing a specific process, or for more complex processes a sub-process, we need to determine process subjects, stakeholders, inputs, rules, and the division of labour. Subsequently we need to reflect on specific affordance categories as demonstrated in the sections below.

8.2.1 Easy and Reliable Use of Process Inputs

To enable usage of process inputs we need to ensure that subjects are able to easily manipulate the instruments or sense the required information, as well as that the instrument functionalities are continuously available. One of the ways to facilitate the relevant affordances in this area is provision of training opportunities (psychological cognitive affordances). For example, an ERP consultant complained that when management disregards the training of newly employed staff they have great difficulty coping with the work requirements (C2).

Another way to enable the emergence of action opportunities so the process inputs can be easily used is changing instruments or their layouts (physical and functional affordances). For example, a shipping manager’s and product designer’s work greatly improved when a new teleconference system was deployed that allowed regular contact with overseas customers. While the old system also provided the required functionality the network problems frequently disrupted communication (C5, C10).

Establishing the relevant rules (functional affordances) can also facilitate the emergence of affordances making the usage of process inputs easier. For example, a teacher complained that the stationery room is open only during limited times and frequently he is not able to get supplies needed for classes (C15).

Finally, rescheduling the division of labour so that subjects are more suitable for the tasks (functional affordances) has the potential to assist the usage of process inputs. For example, in a bakery small built employees had difficulties to use some instruments within the required time and the tasks were assigned to other bakers (C7).
8.2.2 Beneficial Interactions with Other Stakeholders

To ensure that subjects have interactions that help them to perform the processes and that the interactions that disturb process enactment are limited, the relevant affordances need to be facilitated. One of the possible solutions is provision of the opportunities to interact (social interactional affordances). For example, an ERP consultancy company introduced 15 minutes weekly stand-up meeting so that the employees could share the projects progress (C2). A product design consultancy company organised team building activities at the start of every project. (C10).

Another possible solution facilitating the emergence of affordances enabling beneficial interactions between process stakeholders was to change the instruments or their layouts (physical and functional affordances) so interactions became easier. For example, a timber company provided all salesmen with a mobile device so they could stay in regular touch with the head office (C9).

Limiting disruptive interactions can also be achieved through the introduction of relevant rules (functional affordances). For example, a machinist was complaining that administrative staff regularly disturbed his work and extended the time required to perform the relevant tasks. This could be limited by banning administrative staff from the production floor and only allowing them to make their requests after the work orders are finished (C14).

Finally, rescheduling the division of labour so that subjects are paired with suitable tasks (functional affordances) has the potential to assist in beneficial interactions within a process. For example, an electrician supervisor regularly teamed up workers with high (10+ years) and very high (20+ years) experience together. Teams of only high experienced workers tended to get much less work done (C12).

8.2.3 Common Understanding of Process Stakeholders

To ensure that cultural conflicts do not disturb process enactment and subjects have a common understanding of instruments, interactions with others and the applicable
rules, the relevant affordances should be facilitated. This can be achieved by provision of opportunities to learn and raising awareness about other cultures (psychological cognitive affordances). For example, in a shipping division of a global mining corporation more experienced employees were sitting among the younger workers to guide them when required. In some cases such guidance included cultural awareness, such as giving a bribe in the form of cigarettes when the ship was passing through the Suez Canal (C5).

Another way to facilitate the emergence of action opportunities enabling a common understanding is provision of the opportunities to interact (social interactional affordances). For example, in a product design consultancy company, manufacturers culturally distant from designers were involved in product design from the early stages. This approach allowed manufacturers and designers to interact together and better understand each other (C10).

8.2.4 Motivation of Process Subjects

To ensure that people enacting the processes are motivated and their goals are more aligned with the process objective, the relevant affordances have to be facilitated. As emotional beings, humans are often demotivated when they encounter negative emotions in the form of anger, frustration or annoyance. Consequently, motivational affordances can be facilitated not only by improving a subject’s position (i.e. career advancement) but also by ensuring that his/her position is not worsened and negative emotions are minimised (i.e. by ensuring that instruments are functional).

One of the ways to motivate people is to provide them with career opportunities through learning (psychological cognitive affordances). For example, a sale engineer was highly motivated when the company sent him to a course (C13).

Another way to motivate people is to provide them with the opportunities to interact with others (social interactional affordances). For example, microbiologists in a pharmaceutical laboratory were demotivated when interactions with customers were taken away from them and assigned to administrative staff (C11). Sometimes,
the solution may be offered outside the process. For example, an accountant in a large accountancy firm was more inclined to collaborate with people she personally knew from corporate social events rather than those she just talked with over the phone (C16).

Providing instruments with high usability and reliability (physical and functional affordances) also facilitated motivational action opportunities. For example, a beautician was frustrated when a UV lamp has broken and the customer could not be served (C4).

Another way to ensure that people are not demotivated is establishing the relevant rules (functional affordances). For example, a manager of a not-for-profit organisation was annoyed when new guidelines led to different treatment rules for old and new customers and confused the employees (C8).

Finally, rescheduling the division of labour so it is more aligned to the relevant subjects could also influence motivational affordances. For example, in the shipping division, the manager was assigning dealings with sites in the same time zones to an employee who loved talking over the phone, while dealings with different time zones were assigned to an employee who was shy and preferred written communication (C5).

8.2.5 Summary

All four co-researchers positively evaluated the proposed practitioners’ heuristics and confirmed the practical utility of the proposed solutions. They confirmed that they could use it to improve the processes for the subjects enacting them and commented on its comprehensive nature:

"Definitely. Some projects are more complex, some are less complex so it depends on the complexity and you adapt. But what you propose is very good approach (...). It makes a lot of sense." [C18 172 & 176-178]
“Certainly this does make a lot of sense in terms of how you would structure the change or the process design, when you hit roadblocks or difficulties. It is almost a way to say: ‘OK what are my alternatives’ I’ve tried this, what is the next step?’ So it’s like a process for process design.” [C19 106]

“It so happens that you’ve actually covered everything, every single aspect. And some aspects may work in some organisations and in others all of those can work. So you sort of have to adapt and massage your solution for your organisation (...) I would absolutely use this flowchart. It’s great. It covers every aspect that the employer should look at or the organisation to look at (...) I will put it in my file because it covers everything.” [C20 114-118]

8.3 Chapter Summary

This chapter dealt with the evaluation of the study. It confirmed the importance of psychological, social, physical and functional factors influencing process enactment and built a set of guidelines for designing processes facilitating the enactment of process tasks. The guidelines refer to adjustments to different elements of the Activity System (process subject, stakeholders, inputs, rules and the division of labour) in order to develop specific enabling conditions of the process environment, in other words business process affordances.
9 CONCLUSIONS

The first part of the current chapter presents the answer to the research question. This is followed by arguing the completeness and quality of the answer through discussion on how the research success criteria have been met.

The second part of the chapter presents research contributions. Most importantly, the segment identifies the thesis theoretical contributions, such as extending existing knowledge to improve business process design so it can facilitate system adoption and limit process bypassing. The section ends with a description of the research’s practical contributions.

The next part of the chapter describes the limitations of the current study related to the chosen co-researchers and their work context as well as to the chosen research paradigm. This is followed by the final section discussing suggestions for future research.

9.1 Answering the Research Question

The insights provided by the current study into business process affordances have addressed the research question: “How can business process design be extended to consider affordances so as to enhance participants’ perception of action opportunities during process enactment?” The summarised answer to the research question is that by relying on Activity Theory which considers a number of sociocultural elements of the business process environment and the Theory of Affordances which looks at enabling conditions of the environment where human actions take place, business process design can be improved to encourage (prompt) process participants towards a goal-directed action producing a particular impact closely matched to the planned process objective. The novel approach proposed by the current study incorporates psychological and social factors into the process design which in turn could potentially increase system adoption and decrease process bypassing and ultimately
assist in making an organisation’s work more effective, efficient and capable of adapting to an ever-changing environment.

The subjects’ perception of action opportunities during process enactment can be enhanced by designing processes in such a way that human capabilities, motivation, interactions and culture are taken into account. This can be achieved by: ensuring that the necessary training and knowledge sharing takes place; providing a challenge; encouraging interaction so that people can feel part of the team and can call on others when necessary; mitigating potential cultural conflicts; making available reliable inputs with high usability; establishing uniform and reasonable rules; and scheduling labour with clear ownership of the required tasks.

As all the research success criteria specified in section 1.4 have been met I consider the answer to the researched question to be of high quality. Firstly, the research objectives aimed at helping to answer the research question have been satisfied.

Objective 1 (Formulate an initial framework of business process affordances as viewed in the context of human activity within a work environment) has been completed in Chapter 2 with the Affordance Activity Framework developed from the literature. Section 2.5 described the model and Figure 2.9 provided a preliminary graphical representation of business process affordances. Physical, psychological, social and functional affordance categories were established, and the business process elements such as process subject, inputs, objective, stakeholders, rules and the division of labour were revealed.

Objective 2 (Investigate the experiences of various stakeholders regarding the processes that facilitate or hinder process enactment) has been fulfilled by the elicitation of the experiences through the pilot study and interviews with a wide range of business process participants. The number of interviews was deemed sufficient when saturation point was reached and no new insights on issues relevant to the research question were revealed. These are detailed in Chapters 4 and 5. Changes in process design encountered in the study facilitated the emergence of new affordances or hindered the existing action opportunities. Co-researchers were
therefore in agreement that the specific way in which the business processes are designed in their workplace could enable or constrain their actions.

Objective 3 (Identify how, in the view of relevant process stakeholders, the emergence of action opportunities during the enactment could be facilitated through the process design) has been met in Chapters 5 and 6. Co-researchers’ experiences revealed 61 issues having some influence over process enactment. The hermeneutic phenomenological process reduced the original preliminary codes to seven themes including human capabilities, motivation, interactions, culture, process inputs, rules and the division of labour. Co-researchers’ experiences clearly suggested that the intentionality of people enacting processes was influenced by psychological and social aspects, while the design of business processes focused on functional aspects related to the production of process outputs. Hence, to utilise business process action opportunities we need to bring human motivations, emotions, interactions and culture into the process design. Such an approach bridges the existing gap between the human actor and the business environment and facilitates the emergence of all affordance categories. It was clear from both the pilot study and the interviews that taking into account human aspects made processes easier to follow and more acceptable to the people concerned, which ultimately addresses the researched problem of process bypassing.

Objective 4 (Synthesise the collected insights in an improved framework for understanding business process affordances and their utility in process design and enactment) focused on combining the literature review and the experiences of individuals involved in performing the processes to create a cohesive framework for understanding business process affordances and their application in the process design and enactment. The research suggests that people’s actions within the sociocultural process environment are very complex and depend on many factors. The final Activity Affordance Framework, based on the merged literature and process enactment practice of different individuals, is presented in Chapter 7 and graphically illustrated in Figure 7.1.
The final objective (Evaluate the improved framework for understanding business process affordances and its application in process design) focused on discussions with process designers on research themes as well as physical, functional, psychological and social aspects of process enactment. Practical solutions proposed by co-researchers were incorporated into a set of guidelines for designing the processes which not only advance business goals but also facilitate human actions, making the processes easier to follow. The final practitioners’ heuristics is presented in Chapter 8.

The second success criterion of the research specified in section 1.4 has also been satisfied. Sixteen interviews with practitioners engaged in process enactment were conducted and the saturation point has been reached as newly collected data simply repeated what was already known (no new codes were discovered in the last 6 interviews) or was not in conflict with previously obtained knowledge.

Finally, the last success criterion specified in section 1.4 has been met in the evaluation phase of the research. Practitioners involved in the business process design discussed the research findings and confirmed the usefulness of incorporating psychological and social factors into the process design. The practitioners’ heuristics were created as a collaborative effort and evaluated as a comprehensive tool that can be applied by designers to create processes fit for the context in which they are to be used.

9.2 Contributions

9.2.1 Theoretical Contributions

The first important theoretical contribution of the current research relates to extending the existing body of knowledge. This was achieved by synthesising the Theory of Affordances and Activity Theory which resulted in one consistent framework for designing business processes that considers both human and environmental factors. The unique approach of using action opportunities in the context of business processes offers new insights into business process design and
enactment and is of great interest to the Information Systems and Business Process Management disciplines. This novel framework improves process design by taking into consideration aspects that the existing process design methodologies do not easily incorporate. The inclusion of psychological and social factors strongly affecting human actions allows us to design processes that people can actually undertake and find comfortable to follow. Such an approach offers great benefit as it can lead to higher acceptance of information systems and lower process bypassing and ultimately assist in making an organisation's work more effective, efficient, and capable of adapting to an ever-changing environment.

The second important theoretical contribution of the current research relates to confirmation of the existing body of knowledge in the IS and BPM disciplines. Firstly, Activity Theory was confirmed as a suitable lens to analyse human actions within the context of business processes. All elements of the Activity System (Engeström 2000) were clearly visible in the experiences of co-researchers and the significance of sociocultural aspects influencing human actions was confirmed. Secondly, the research findings were consistent with the Theory of Affordances (Gibson 1979) since enabling conditions of the business process environment were confirmed as important in guiding activities of all co-researchers. Finally, the study corroborated findings of other academics within the business process domain. These include the importance of: taking a holistic organisational perspective including personal and cultural aspects related to business processes (Hammer 2010); focusing on cultural and behavioural issues to achieve acceptance and truly engage people in business transformation (Schmiedel, vom Brocke & Recker 2013); and accepting greater responsibility and facilitating more inspiring designs for processes that are both profitable and more humanly satisfying (Krippendorff 2006).

Finally, the research also made a small theoretical contribution to the Theory of Affordances by applying this theory to human action within the highly complex sociotechnical context of business processes. This addressed a recognised shortcoming in the literature where affordances have been used to explore simple operations in detail but examination of more complex actions is lacking (Pols 2012).
9.2.2 Practical Contributions

There have been frequent calls for IS researchers to make their research practically relevant (Baskerville & Myers 2004; Zmud 1998). As an understanding of business process affordances has been developed in cooperation with practitioners, the research offers a clear contribution to business practice. Firstly, it illuminates the role of process affordances in the alignment of process design to process enactment. Secondly, it provides a set of guidelines to be used by designers to utilise the notion of affordances in the process design.

The business process design should take into account the relationships existing between different process elements, and the utilisation of affordances offers good prospects in this regard. Designing processes with different affordance categories ensures that all facets of human behaviour are taken into account and the processes are more natural to follow. This includes not only physical aspects originally advocated in the affordance literature but also the functional side supported by modern business process approaches, and psychological/social attributes postulated by socio-organisational theories. This unique approach to aligning business process design and enactment has a capacity to help designers to create processes that are more likely to be accepted by participants and addresses the continuous problem of process bypassing illustrated in section 1.1.

The practitioners’ heuristics presented in section 8.2 and illustrated in Figure 8.1 are based on the revised AAF model (see Figure 7.1) and evaluation of the findings by individuals involved in the process design. Being a meta-layer that can be applied to the existing process design, the heuristics can be used for newly designed processes as well as processes that have been enacted for a long time but which developed issues with process bypassing. Such heuristics can be used to assist designers in: considering the affordances that are most appropriate for specific types of subjects and areas of design concern, and creating processes that are a good fit for the particular context in which they are used.
9.3 Study Limitations

There are limitations to the presented study and it is important to state them. Firstly, the investigation was conducted in an Australian context although some co-researchers worked in organisations with international dealings (C2, C3, C5, C6, C9, and C10). However, it is possible that a different context could reveal additional factors relating to the manifestation of process affordances.

Secondly, this study focused on analysing process enactment and design from the experiences of 21 participants (1 pilot study, 20 interviews) working in different businesses. Care was taken to choose a widely representative range of companies, industries, sectors, ages and cultures, however, some additional factors could be applicable to organisations and people that were not specifically researched. Only two participant from the not-for-profit sector were interviewed and it is possible that issues particular to such institutions are not in evidence in my study.

The employed hermeneutical phenomenological method allowed me to gain insights into the personal perceptions of co-researchers, however, the findings of qualitative research structured within a constructivist–interpretive paradigm cannot be generalised (see section 3.3.3). It is worth noting nevertheless that these findings were confirmed with independent practitioners, as recommended by the methodology and explained in chapter 3.

9.4 Suggestions for Future Research

The following suggestions for future research could address limitations of the current study and advance the existing knowledge by facilitating the application of the business process affordances approach to process design.

To increase transferability of the findings future research could be undertaken to study process participants from more industries and backgrounds.
As with any interpretive research, the findings are indicative and future research could explore casual relationships between the emergence of specific affordances and changes made to different elements of activity systems (process subject, inputs, rules, stakeholders, and the division of labour).

Finally, my framework presented in Figure 7.1 and Figure 8.1 was created using a hermeneutical approach where my initial understanding of business process affordances, based on the literature and my experiences, was further advanced by discussions with every co-researcher involved in the study. The model was further evaluated by discussion with other practitioners which resulted in the final set of practical guidelines. The practitioners’ heuristics were built post hoc, meaning they were based on past experiences but not tested in practice. It would therefore be useful to apply my findings and use the proposed practitioners’ heuristics ad hoc, when new processes are being designed or the problem of bypassing the existing processes is reported. Action Research, aimed at practical problem solving where a researcher intervenes in the problem setting (Baskerville 1999), could be used for that purpose. Another way of applying my new framework in practice could be undertaken by process designers involved in new system implementations or business process design changes.

9.5 Summary

This research was motivated by the problems recognised in prior research and business practice relating to the mismatch between business process design and enactment as well as by my 15 years of professional experience in implementing ERP solutions and encountering problems with process bypassing.

Through the application of a hermeneutical phenomenological method of inquiry (see chapter 3) to study business process enactment, a number of interesting insights into the emergence of business process affordances were discovered (see chapters 4-8). These insights can be utilised in the business process design to make the processes more acceptable and easier to follow.
The business process is an intentionally designed artefact (see planned objective in Figure 7.1), but people’s actions within such a process are dependent upon a range of human factors (see capabilities, motivation, culture and interactions in Figure 7.1) that can influence process enactment. The main recommendations of the study is therefore to design business processes by relying on Activity Theory, which considers a number of sociocultural elements of the business process environment, and the Theory of Affordances which looks at enabling conditions of the environment where human actions take place. Such an approach can lead to more satisfying design by bringing us closer to the creation of processes that offer a better fit between the systems, processes and their users. Improved alignment between process subjects and the environment facilitates the emergence of different categories of action opportunities.

The novel approach proposed by the current study incorporates psychological and social factors into the process design, which in turn can increase system adoption and decrease process bypassing, and ultimately assist in making an organisation's work more effective, efficient and capable of adapting to an ever-changing environment. By taking into consideration affordances during the design of a business process, the process can encourage (prompt for action) participants towards a goal-directed action producing a particular impact closely matched to the planned process objective, thus addressing the research problem of a mismatch between process design theory and practice.
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TO: [Full Name]

Plain Language Statement

Date: 6 Aug 2012

Full Project Title: Enhancing business actions and decision-making through the use of affordance-driven business process design

Principal Researcher: Edyta Rozycki
Supervisors: A/Prof Jacob Cybulski
Dr Susan Keller

You are invited to take part in this research project. Your participation is voluntary and will not affect your relationship with the researcher or with your ERP system provider or vendor. Once you have read this document and agree to participate, please sign the attached consent form. You may keep this copy of the Plain Language Statement.

The main aim of this study is to investigate how business process design drives or constrains the business actions and decision-making of the process participants.

Business process design is widely seen as the top priority in organisations intending to thrive in highly competitive global environment. Process design (or redesign) aims to optimise operational performance of an organisation by identifying people, resources and activities which need to be involved in achieving specific business goals. Process design or redesign is often undertaken during the implementation of computer systems which facilitate workflows and the flow of information between the process participants.

This study aims at gaining an understanding of human activity in the business environment by exploring how business processes are performed in day-to-day practice and how process participants’ actions and decision-making are enhanced or constrained by business systems and process design. The research will allow us to create a comprehensive theoretical framework for business process design based on action opportunities offered to participating individuals. The investigation will also evaluate the utility of the created model through discussions with business process designers and participants.

You have been selected to take part in this project because of your recent experience of the implementation of an ERP system which addresses the design and/or redesign of business processes taking place in your organisation. With your consent, your participation in the project will involve observations of the setup sessions, during which discussions on business processes would take place, and a follow-up interview, of approximately one hour. You may of course decide to stop participating in the observation session or an interview at any point in time. Up to
the time of publication or results, you may also ask that any information collected at your interview be altered or destroyed and not used for the research.

With your permission we will voice record the interviews. All voice recordings will be transcribed and together with our notes and any other documents that you may give to us would then be analysed for research purposes. Note that the transcripts will be anonymised so that your identity and the identity of your organisation would not be disclosed in any of the publications resulting from this project.

A copy of the summary report on the research and any publications arising from the project will be available to all participants on request.

Indicative interview questions include:

Could you briefly describe your role in the organisation?

Please describe the business processes you are involved in during your day-to-day practice.

What involvement, if any, did you have in the design/redesign of the business processes you participate in?

What instructions, training or models on the business processes you participate in were provided to you by your workplace?

Can you explain your experience in learning and understanding the business processes you participate in?

What is your understanding of the objective of the specific business processes you participate in?

Can you think of any examples in which the business processes you participate in frustrate your ability to make decisions or take actions?

Can you think of any examples in which the business processes you participate in enhance your ability to make decisions or take actions?

To comply with the government requirements all research data will be stored securely for a period of a minimum of 5 years after the final publication. It will then be destroyed.

Approval to undertake this research project has been given by the Human Research Ethics Committee of Deakin University. If you have any complaints about any aspect of the project, the way it is being conducted or any questions about your rights as a research participant, then you may contact: The Manager, Office of Research Integrity, Deakin University, 221 Burwood Highway, Burwood Victoria 3125, Telephone: 9251 7129, Facsimile: 9244 6581; research-ethics@deakin.edu.au.

If you require further information or if you have any problems concerning this project, you can contact the researcher - please quote the project number BL-EC 40-12. The researcher responsible for this project is:

Edyta Rozycki
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Deakin University
221 Burwood Highway
Burwood VIC 3125, Australia
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PLAIN LANGUAGE STATEMENT AND CONSENT FORM

TO: [Full Name]

Individual Consent Form

Date:

Full Project Title: Enhancing business actions and decision-making through the use of affordance-driven business process design

Reference Number:

I have read, or have had read to me and I understand the attached Plain Language Statement. I freely agree to participate in this project according to the conditions in the Plain Language Statement. I have been given a copy of the Plain Language Statement and Consent Form to keep.

The researcher has agreed not to reveal my identity and personal details, including where information about this project is published, or presented in any public form.

Participant’s Name (printed) ……………………………………………………………………

Signature ……………………………………………………… Date …………………………

Please send this form to:

Edyta Rozycki
School of Information Systems
Deakin University
221 Burwood Highway
Burwood VIC 3125
Australia

Phone: 0407 114 715
Email: erozycki@deakin.edu.au
Withdrawal of Individual Consent Form

(To be used for participants who wish to withdraw from the project)

Date:

Full Project Title: Enhancing business actions and decision-making through the use of affordance-driven business process design

Reference Number:

I hereby wish to WITHDRAW my consent to participate in the above research project and understand that such withdrawal WILL NOT jeopardise my relationship with the researcher involved in this project

Participant’s Name (printed) ..........................................................

Signature .......................................................... Date .................

Please mail or fax this form to:

Edyta Rozycki
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221 Burwood Highway
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Australia
Phone: 0407 114 715
Email: erozycki@deakin.edu.au
APPENDIX 2 – Individual Textural Descriptions

Interview 3

As an IT director of a global manufacturing and selling corporation for the past 12 years, C3 oversaw the deployment and maintenance of multiple information systems supporting the operations of the Asia Pacific arm of the group. Business diversification across multiple product lines (tools, cookware, educational equipment, etc.), geographical places and cultures exposed the co-researcher to a high level of complexity within the technical and human sides of the organisation.

The most challenging aspect of work for C3 related to people. Processes considered to be the best world practice and successfully implemented on many sites could still become failures due to the human involvement, which introduced reliance on people to follow those processes.

To gain support for the processes and changes, operational people had to be involved in the design. One of the recent changes in the business processes of the IT division was the introduction of subregional IT managers. The reason behind that change was to ensure that the required projects were visible and the business requirements properly understood by the IT team. Additionally, such managers worked directly with operational people at different locations and could facilitate the acceptance of the project by future participants.

“Subregional Managers (...) part of their role is to sit down with the local businesses on the operating committees to understand the business requirement and basically feed for the PMO to ensure that the various projects that need to be done are visible.” [C3 22]

“When we look at our structure of our people, we focus on our subregional managers working with the local business (...) so they drive the project (...) to make sure you have that buy in.” [C3 94]
Knowledge facilitated process enactment and the organisation provided training for any new technology that was implemented. Training materials, including flow charts of the new processes, were also created to facilitate learning. Training was also used as a motivational tool as people were interested in developing skills. There were, however, circumstances when the policy was quite hard to implement. An example may be the implementation of the new Point of Sale software in China where a high turnover of employees contributed to the failure of the training program.

C3 reflected on his organisation’s practices and noted that the important part of improving people’s motivation to work was the strategy of skill development and long-term career progress. To achieve this, training was regularly provided and periodic career evaluations took place. Motivated people were more inclined to do what was good for the business as the organisation’s gain was also their own.

“Part of the strategies we have to have in place is, how do you support the people, as well as, how do you support the process?” [C3 225]

“You do want to make sure that you can get a long term benefit from this person.” [C3 241]

Every change in the business had to be presented to process subjects, so they understood their own benefits and they were motivated to accept that change. Change was constant in the business environment and it was important to gain the support of the people enacting the processes by motivating them, so they were more inclined to do what was good for the business.

“Change is always going to be there, we’re not going to stop changing, so you want people to be comfortable with change.” [C3 245]

“If you look at our businesses and from an IT perspective, the human element is the most difficult (...) because it’s always, what’s in it for me? Why should I make a change? (...) So when we go into meetings we have to answer that question ourselves before we step in because we know we’re going to get it.
C3 asserted that when working in a global company, the collaboration between people was more complex due to the different locations and cultures involved. When people across different countries needed to cooperate there were at times communication and language issues. The organisation addressed the collaboration problems by improving communication between the relevant parties. This was done through regular meetings, utilising people with specific skills across geographical locations, and changing some processes. For example, experts in the information system within the Australian selling company supported staff from the Asian manufacturing company who used the same software, or a new Share Point based tool was implemented so people could share the information between themselves more quickly and easily.

The important aspect of collaboration was trust. Most people were not involved in the whole process so they had to trust others who were making the decisions. There was an inherent conflict within some business processes when it came to collaboration, as different people perceived the world differently and consequently could make contradictory decisions. This was especially true for different tiers of the organisation (employees, managers, executives):

“At times, they don’t necessarily make the same decision that you would make because their view is a little bit more narrow than what mine is (...) that’s where you get certain conflicts, because they’re making decisions and they believe they’re making the right decision, it doesn’t mean it’s necessarily the right decision for here.” [C3 213]

People collaboration could be influenced by culture. For example, in Japan a typical workplace was set as an open space with managers sitting at the front and looking at their staff. Employees were more concerned with their boss than with other employees they needed to work with.
Culture was pointed out by C3 as being one of the most important human factors driving the business processes. For example, some countries were very much oriented towards senior management and if “the boss doesn't want to do it then it doesn't happen” [C3 56]. There were cases in Thailand where MRP system was deployed and running smoothly, but after the transition period ended and IT employees left the site, the warehouse staff went back to using the spreadsheets. The warehouse manager was not specifically supporting the system and therefore the employees did not consider it important.

People from countries such as Thailand, Malaysia and China did not also speak up when things went wrong, which could lead to bigger problems. For example, an MRP system had to be re-implemented in China, with enormous cost to the business. People from western cultures did not have that much respect towards the management and they questioned many decisions. The underlying reason was that people who do not question things appear to be unknowledgeable or poor performers. Regardless of cultural differences however there were issues in every place when it came to process enactment.

“You have issues in every country. This is not just a China thing, nor is it a Japan thing. Each has their own pluses and minuses when you’re trying to change processes.” [C3 147]

“Things do go much more slowly up in Japan in particular. But it doesn’t mean it’s harder. Here is just as hard, but for different reasons.” [C3 156]

Culture made people perform not as well as they could just to conform to the expectation of those around. For example, a financial controller from Japan was seen as very capable while working on a project in the US but was barely visible while working on projects in Japan:

“It's not necessarily the capability of the person, but the culture around it, that can have an impact on processes.” [C3 166]
One of the organisational rules strictly adhered to was the **standardisation** of operational processes. Standard processes were easily supported by **information systems**. Even if technical difficulties threatened the company they were eventually dealt with.

“Internal processes we're relatively strict on (...). You might have half a dozen little mods in our system to operate across Asia Pacific, outside of the vanilla version. Because we just say, 'Account payable, that's how you operate'. It's not a discussion, that's how you do it. 'Receivable, that's how you do it.' We're selling the same product, therefore we can do it the same way. So we have flexibility in dealing with pricing for customers, but procedurally it's the same. And that's something I've enforced for 11 years.” [C3 168]

**Technological** solutions facilitated **transparency** and **visibility** for people and their work. For example, a special Share Point based tool was introduced so the information could be accessed across the organisation and viewed within the enterprise applications or in other business intelligence (BI) system. The utilisation of process resources was no longer in employees’ heads or email or phone but became visible for everyone involved. This facilitated **management** and **knowledge** improving process **effectiveness** and **efficiency**.

**Process efficiency**, relating to achieving maximum productivity with minimum cost, is one of the main ideas behind the introduction of business processes. One of the examples supporting that claim is a manufacturing company in Japan purchased by the organisation a few years ago. The company was almost bankrupt after years of neglect by the owner. **Inefficiencies** related to poor receivables management, using extensive factoring, using old computer systems that slowed down the work, and keeping staff on the payroll after the retirement age. Within customer payments processes there was no system a keeping detailed track of the amounts that customers owed. When a customer payment was received the whole account was simply cleared without checking any differences.
“They lost $50 million dollars in sales over the time we bought them, they’ve now got that back. It’s making money, where it didn’t make money. A very, very successful turnaround and we’ve had to get into the factories in China, Taiwan, Korea, and do the same thing (...) So we changed processes, systems, restructured how they did things, and it’s very successful now.” [C3 182]

While process efficiency was important, it did not have to always be the best solution for the business. There could be specific circumstances when the process was designed inefficiently in order to gain other benefits. For example, recently, the organisation closed their Hong Kong entity selling goods manufactured in China and created a new Luxemburg entity that took over that role. The change doubled the processing (by introducing additional steps in the ERP system) but brought significant returns in the form of big tax saving.

Operating businesses in different countries created a problem of compliance with different regulations across various business locations when the processes were performed. “Generally speaking, you get around most things” [C3 96]. The variety of rules offered the opportunity to set up the structure that gave you the best benefits; for example, setting operations in the country where you can save most on tax paid. There were however cases where cultural difference in getting things done presented a challenge. For example, specific actions, such as paying “a fee under the counter” [C3 96] were allowed in one country while being an offence in other places.

Technological solutions enabled managers better planning and monitoring of resources. For example, the formalisation of dealing with IT projects through a new Share Point based tool resolved situations where in some circumstances IT employees were working on the important business undertakings without their manager’s knowledge.

Attitudes towards management differed in the Asia Pacific region. Some countries were very much oriented towards senior management, for example Asian people respected management and the hierarchy was important. In such circumstances tolerance for bad performance was greater so people did not question everything. In
western culture people do not have that much respect towards management and they questioned many decisions.

There was an inherent conflict within some business processes as different people perceived the world differently and made different decisions. This was especially true for different tiers of the organisation (employees, managers, executives).

“What I can see from processes is different than some of these people. But that's where you get certain conflicts, because they're making decisions and they believe they're making the right decision, it doesn't mean it's necessarily the right decision for here.” [C3 213]

**Interview 11**

C11 was a microbiologist in her 40s who came to Australia from Chile 23 years ago. She finished her Bachelor of Science in Chile, and Laboratory Studies in Australia. Seventeen years ago she was employed as a microbiologist in a company providing a range of different laboratory services (soil, minerals, petrol, chemistry, etc.) around the globe although the laboratories worked independently of each other. A year ago the company purchased another laboratory, which significantly increased the business and the number of employees (from 30 to 300 in C11’s location). C11 worked in the pharmaceutical division and her duties involved checking that the appropriate tests were performed correctly; issuing, signing and sending laboratory reports; and performing some specialised tests that only senior microbiologists could do.

Specialised knowledge was required to enact the processes in the laboratory. New technology was being introduced all the time and as a result the knowledge had to be constantly kept up to date. For example, many tests today are performed using an electron microscope, which did not exist 20 years ago.
While the knowledge was essential the practical experience was more important. For example, a highly qualified doctor was employed by the organisation but had to be dismissed as she could not perform basic tests.

C11 reflected that just following instructions instead of coming up with the solution to a problem made people lose their concentration. For example, when processes were changed, microbiologists stopped designing the methods and were only responsible for conducting tests designed by others. They got into a habit of doing things, worked through the routine as though on automatic pilot, and did not pay much attention. As a result, mistakes were made and work effectiveness decreased.

C11 asserted that while the financial rewards were a motivational tool, more relevant was to ensure that process subjects had challenge in their work. For educated people, that challenge included dealing with different problems and not just repeating the same tests every day. Even though the company was doing very well financially, people were frustrated as their work became monotonous and was reduced to working with a limited number of products, such as cheese.

Challenging work made people proud and they took ownership of the job. Before the change, microbiologists had to design the tests and perform them. They took responsibility for the work and paid better attention to it. After the change microbiologists were performing tests designed by analysts and they did not take responsibility for the final results. They made more mistakes and when such errors were discovered people put the blame on others. Company growth in recent times through acquisitions increased the division of labour and through that collaboration between employees, but at the cost of their motivation.

C11 reflected on her organisation’s practice and noted that a good way to motivate people was to make them feel as part of the team. Regular socialising events were a good way to achieve this as people could not be happy with just work and needed relationships and friendships around them. Another way to motivate people was the provision of common facilities where they had a chance to relax and socialise. This was important as people spent more time in the workplace than with their families.
Before the organisational change there was regular morning tea for employees but after the change the budget was cut off. People became less comfortable in the workplace and less happy, which in turn decreased the effectiveness of their work.

Another good way to motivate employees was to provide them with training and opportunities for skills improvement, as people had a need to continuously develop. Before the change the microbiologists were sent regularly on courses and conferences and they knew that the company was concerned with their progress. After the change the budget was cut off and people became disconnected from the new advancements and the business; they did not consider company goals as their own.

“Some people need to keep knowledge and learning (...). In this little company, they've always sent us to do courses and study and training. And in this company at the moment it's nothing. Like no one has been in training, like a proper going to learn more things (...) we used to do every year or every two years, people were going for trainings and conferences but now everyone is completely disconnected.” [C11 88]

Training is a long-term process and it should be pursued even if it is costly as ultimately it will make people work more effectively and efficiently. It was important that process subjects were trained in different fields, as being exposed to just one area lead to boredom and lack of motivation. The best way to train was for people to visually see how things are done rather then read about it, as they would better remember how to perform specific tasks.

“The time required to teach people, you know what we were talking about, it takes time, it's not efficient I would say, quicker, it's not go, go, go - but at least you feel like people will be happier. And I think when you are in a company where people are happier, actually you get more productivity, make better results.” [C11 122]
Finally, to motivate people the instruments and technology required in the processes should function properly. For example, when computer screens regularly froze people were often frustrated and demotivated.

“I see people in my work they are not happy because of the situation, they get frustrated, the computer is always frozen, then breaks down. So they arrive in the morning and they press the button and the computer is not working, so straight away they are frustrated.” [C11 123]

C11 indicated that one of the most important aspects of her work was contact with people, be it customers or other process participants. Interaction and socialising with people created an atmosphere of friendship and made people happier. Additionally, other people could help in solving problems that arose during process enactment. Overall, interactions with people increased employees’ satisfaction and made them work more effectively and efficiently. When the work was restructured in the organisation, for many microbiologists contact with other people became limited. For example, dealings with customers were moved to the administrative staff, and microbiologists’ work became more monotonous. Importantly the customers started to leave as they could not get the answers to important questions from staff who were not knowledgeable enough. After six months the management reversed their decision and microbiologists were dealing with the clients again. In another example, the division of labour became more specialised and microbiologists’ tasks were advised through the information system screens. As a result there were cases where microbiologists put away problematic tests without attempting to work on them as they felt that there was no one they could contact for assistance.

Interaction with others motivated people and allowed transfer of the required knowledge. For example, microbiologists explained to administrative staff how to enter information required for testing into the computer, and the number of data entry mistakes decreased.

Some technological advances were quite complex and introducing the new instruments into the process became cumbersome and required highly specialised
experts. In some cases new machines could not be operational six months after the purchase as there was no specialist that could make it work. Additionally, training was required to ensure that new procedures were understood by the employees, and during a transitional period the work had to be done using the old and new equipment to ensure the results’ validity.

Process inputs included the information required by the customers and obtained during the relevant laboratory tests. The knowledge of employees was therefore important. When administrative officers took over dealing with clients the customers started to leave as they could not get the answers to important questions.

New instruments could increase process effectiveness and efficiency. Firstly, technology could automatically transfer the results from the machine to the computer without the need for typing and additional resources for checking the data entry. Secondly, the tests could be performed quicker and with less human involvement. As a result of the improvements, however, the employees were afraid of unavoidable dismissals for part of the workforce.

Some technology solutions had a completely different effect and made work very inefficient. The best example was a new information system for preparing laboratory reports which was introduced one year ago. While the application worked well for other laboratories it was unsuitable to the pharmaceutical branch due to the specifics of their work. Time delays were significant (in some cases reports that took four hours in the past required eight hours) and the decision was made recently that a special solution for the pharmaceutical division will be created.

Another problem with information systems related to one database being used by all laboratories around the world. As a result there were significant delays when multiple countries used the system and computers regularly froze. Users were often frustrated and their work was seriously disturbed.

As laboratories dealt with chemical substances, safety was a big concern. The company had a strict safety policy and a safety coordinator was in regular contact
with all laboratory employees. Protective clothing had to be worn and for some tests a special safety cabinet is used to ensure that the experiments are performed in air-pressured conditions. To ensure that people were **familiar** with the relevant **regulations**, a monthly bulletin dealing with different aspects of safety was issued.

While **safety** regulations were rigidly **complied** with some other **rules** were **bypassed**. With the business merger new methods were created and in accordance with the guidelines all employees had to be trained. However, no training was provided, but when the National Australian Testing Authority was coming for an audit all employees were asked by the managers to sign the document to the contrary. Many people were frustrated as they felt that the **managers** abused their **power** by asking them to sign something that was not true.

After the organisational merger, the business structure became more complex and new **managers** were introduced. Employees became confused about who was **responsible** for what and were not sure which manager should deal with particular issues. Many personnel **changes** that made people uneasy were introduced. For example, C11’s manager was effectively de-promoted and so she started to report to her former employee.
### APPENDIX 3 – Preliminary Coding

Table A3 1: Examples of preliminary coding.

<table>
<thead>
<tr>
<th>CO-RESEARCHER /STATEMENT ID</th>
<th>STATEMENT</th>
<th>PRELIMINARY CODING</th>
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<tbody>
<tr>
<td>C1 60</td>
<td>&quot;I had a very old chair so it was just replaced. The problem with the chair was that it was just breaking too often. It didn’t look old but it was just breaking too often. So it looks a bit different because ... and my change is good because I have a new chair but the old chair was positioned better than this one is. Like when I have a patient lying down, I don’t have enough space between cupboards and the chair, because the chair is positioned differently than the old one was.&quot;</td>
<td>Instruments Changes Reliability Physical layout</td>
</tr>
<tr>
<td>C2 22</td>
<td>&quot;The main drawback of working in a small organisation is ... people, the management doesn’t spend more on training, training their resources. So if you hire a new person there is no training plan or there is no process in place where ... how to scale him up. So it’s kind of dropping the kid in the ocean instead of the swimming pool with the tutor. You’re dropping him in the ocean and asking to swim. So he has to learn on his own. So that’s where my day, most of my day goes. I advise people on how and what to do, how to approach, what is the kind of approach. And if they are stuck with the technical or functional or they don’t know, explaining to them and get the work done.”</td>
<td>Training Learning Knowledge Management</td>
</tr>
<tr>
<td>C3 166</td>
<td>&quot;Another true example, a financial controller from Japan went to the US, to Boston, to our Headquarters, on an international assignment there a year and a half. They raved about his capability in the US. I think I saw him just before he came back to Japan, I saw him when he had come back to Japan and I went, 'Do you have a switch on your back or something? Because you're not the same person from a few weeks ago.' He says, 'No, I'm back in Japan.' You know, 'This is what's expected of me here, so I will conform to what's expected of me here.' So it wasn’t a capability issue because he had huge capability in the US where he was given that freedom and the expectation was that you have this freedom to make decisions and do x, y and z. But back in Japan that expectation was gone. It was, you now conform to the cultural fit of Japan, you are the controller, financial, a low status anyway in Japan, but you will now perform to what’s expected of you. And that's why I say, with a lot of these things, it’s not necessarily the capability of the person, but the culture around it, that can have an impact on processes.”</td>
<td>Capabilities Culture</td>
</tr>
<tr>
<td>C4 332</td>
<td>&quot;Provide service to the customer, just customer satisfaction at the end of the day, from the second they walk in, to the second they walk out, you’re setting an example on what they’re going to have done and how they’re going to feel. Then at the end of the day it’s, are they satisfied? That’s the most important thing. I couldn’t care less if I had cuts on my fingers and things like that, and you know, dry skin. At the end of the day it’s, are you happy? That’s my goal.”</td>
<td>Customer service Effectiveness Satisfaction</td>
</tr>
<tr>
<td>C5 12</td>
<td>&quot;The way the contracts work was it was a Korean company that had just built a shipyard in the Philippines, so all of the senior managers – the top 250 managers within the shipyard – are all Korean, and they are not, shall we say, very culturally sensitive to working with the Philippine locals which there is about 20,000 of them working within the shipyards. So they don’t understand how to get the best out of these people, and how to encourage them to work safely. Now, it can be done. I also over the last 12 months I dry docked two ships in Subic Bay at another shipyard, all Filipino were managed, far, far better safety, and they understand what safety is, but their customers are companies like Shell and my company, who they understand what’s expected from a safety aspect as opposed to the Subic Bay shipyard which didn’t want to change.”</td>
<td>Culture Safety Management</td>
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<td>CO-RESEARCHER/STATEMENT ID</td>
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<tr>
<td>C6 96</td>
<td>“The open space – we love it and we love it for the – it’s mainly collaboration and learning. Sitting close to each other and listening to people’s conversation allows new employees or even people who sort of work on something else to learn by osmosis and it works very well.”</td>
<td>Physical layout Collaboration Learning</td>
</tr>
<tr>
<td>C7 14</td>
<td>“I’d say the hardest part in one of the processes that I perform is maintaining product quality. So I guess in a lot of organisations, for example, if you manufacture t-shirts a machine is just manufacturing a t-shirt and every single day that t-shirt that it’s making is going to come out exactly the same. I’m dealing with people, so obviously there’s more room for human error, so my biggest challenge is maintaining what I consider a high-quality product, but having it consistent every day. So I currently have six bakers, one baker might manufacture bread a certain way in terms of how he uses his hands – his techniques – in moulding that particular product, then the next day another baker makes that same product, but his technique is different, so then on day one, I’ve got this particular loaf of bread, it’s a good quality and it looks like this. The next day it might be a bit different and it’s hard to make customers understand why some days there are differences in the quality or the appearance and consistency in product.”</td>
<td>Quality Human errors Customer service Quality</td>
</tr>
<tr>
<td>C8 56</td>
<td>“Especially now, when age care reform is on the way we’ve got a lot of problems because from 1 July there will be two sets of guidelines for our one program, and existing clients will have different guidelines and new clients from 1 July will have other guidelines. And we don't know to this time [23 May] what kind of guidelines there will be! They are still discussed in government and there is not much consultation in our industry because they give one- or two-day response to a new proposition. And from our point of view we don’t even have the time to read those guidelines because we have a lot of work with our programs, there are a lot of papers we have to do.”</td>
<td>Compliance Changes Variety Clarity People Involvement</td>
</tr>
<tr>
<td>C9 22</td>
<td>The benefit, the changes that the computer systems have brought in and the little iPads, which is what I’ve started using now. I can actually go into a customer once I get it on my iPhone, sit down there, Bluetooth in, bang. I can sit in front of a customer and take his order while I’m talking to him and put it into the computer.”</td>
<td>Technology Communication Integration Customer service</td>
</tr>
<tr>
<td>C10 38</td>
<td>“Communication with our customers is probably the most important factor in success for the project. So although we were engineers and we’re doing highly technical work, I would say about 70 per cent of the factors that influence the success of that project wasn’t the technical work; that was only about 30 per cent. Most of the success was due to communication and a relationship with the customers and with the team. So communicating, we worked very hard on communication. One of the things that we did was always to make sure that we resolved issues very quickly, we would be in very regular contact and make sure that we were in regular contact either daily or even several times a day with our overseas counterparts.”</td>
<td>Communication Customer service Interactions Collaboration</td>
</tr>
<tr>
<td>C11 87</td>
<td>“Well, financially it’s better. It’s a big company, they pay you well but I would say it’s not challenging anymore for me. It’s just like go into the office and I got reports and I checked the reports and my day is on the computer, half a day or a day all day, and go home and that’s it. Nothing to grow, to say 'Wow we have this challenge. How can we do it? Let's try to figure this out.' It's nothing like you can make your brain work more and just check they did this step. 'Yep, yep, this is the result, sign, that's it, gone'. So money is all right but it’s like ... how do you say if your mind is not making you grow, you are stuck and you want something more.”</td>
<td>Motivation Challenge</td>
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<tr>
<td>CO-RESEARCHER STATEMENT ID</td>
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<tr>
<td>C12 12</td>
<td>“Over the journey of 27 years, people have always taken shortcuts as such. It’s changed a lot in the last 10 years with the laws changing, with the employees being responsible – or can be legally responsible – for their actions as well as the employer and the business, so that’s changed a little bit of what has happened I think in the mindset of people, but the changes have been for the better than for the worst obviously, because there used to be a lot more injuries in our industry then than there are these days, and people getting electrocuted – for want of a better word – but there were quite a few fatalities through the 80s and 90s in our industry throughout the State, through people doing the wrong thing, or a couple of accidents, but that has really dropped off over the last few years.”</td>
<td>Compliance Changes Safety Human errors</td>
</tr>
<tr>
<td>C13 69</td>
<td>“Yes, because from the technical point of view I need to be in contact with many other engineers because customers ask me specific questions about the details of a product. Some information that I have can give them but some I have to get from China. And since an engineer who has information is not able to communicate in English, it should go through a channel, and I’m not very happy with that channel. So language is a problem to put it simply.”</td>
<td>Communication Customer service Information Language</td>
</tr>
<tr>
<td>C14 48</td>
<td>“OK. I try to, in my case, I try to not interfere with a job which is not mine. If I have problems with my work I just go to the manager and I hope the manager understands what the issue is and passes further and sometimes, it happens rarely, I have a feeling that the manager is not up to the job. They don’t understand what the problem really is because of this boys’ club issue. They’ve got their positions because of friends. And I cannot be bothered because it is not my problem anymore. If they want to solve it they have to think which way is better or they have to employ another person who helps the manager, which is like wasting money. But it is the owners’ issue. If they can afford to employ other people that they don’t need it’s their business.”</td>
<td>Management Knowledge Effectiveness Efficiency Motivation</td>
</tr>
<tr>
<td>C15 8</td>
<td>“I’ve had experiences of both I suppose over the years. And I guess it’s very frustrating when there are no clear plans in place, or clear guidelines, and things get changed at the last minute, ‘Oh, we’re doing this now and we’re doing that’, so I suppose I work best when I know what’s expected of me. Even though – like, in teaching, you largely row your own boat basically, because you’ve got to get the kids across the line and so on, but still, in terms of organisational matters, you need to get certain things done by certain dates, so it’s good when those things are planned and not done at the last minute. So yeah, when the senior guys are organised, then it makes your job easy. If they’re not organised and their plans are not in place, then it doesn’t matter how organised you are, and it can be frustrating. I mean, either as a teacher, as a construction worker or as a banker, I’ve still got to do my job properly, regardless of what’s above me, but it does make it easier when the management knows what’s going on in the business basically.”</td>
<td>Planning Management Knowledge</td>
</tr>
<tr>
<td>C16 216</td>
<td>“I think that’s reflective of just the demographic outside of the school gates. Our area here in general is probably increasingly made up of Chinese and Indian families, and that’s quite evident in the enrolments at the school and the pending enrolments for the next 10 years in fact. So with that comes a shift in how payments are made, when they’re made, and just some of the difficulties in obtaining those. Yes there are language barriers, increasingly I see students coming into the office that I wouldn’t have normally before and they are translating for their parents, which surprisingly is increasing.”</td>
<td>Culture Changes Language</td>
</tr>
</tbody>
</table>
Table A4 1: Horizon of experience for C1.

<table>
<thead>
<tr>
<th>COMMON CODES</th>
<th>CONTEXT (DENTISTRY, SMALL BUSINESS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automation</td>
<td>Automation of records (i.e. x-rays) increased process effectiveness and efficiency.</td>
</tr>
<tr>
<td>Changes</td>
<td>Changes were required to ensure that new technologies were taken advantage of and used to improve customer service and process effectiveness and efficiency.</td>
</tr>
<tr>
<td>Collaboration</td>
<td>Collaboration within the team and with third parties was the most important aspect of business processes. It became easier with time when people learnt what works for others.</td>
</tr>
<tr>
<td>Communication</td>
<td>Communication was required to ensure teamwork and collaboration with other parties.</td>
</tr>
<tr>
<td>Customer Service</td>
<td>Customer service was the second most important aspect of business processes, after teamwork. Collaboration contributed to the high standard of patient care.</td>
</tr>
<tr>
<td>Documentation</td>
<td>Details of patient history were required and digitalisation of records (documentation) was the best way to ensure it was always available.</td>
</tr>
<tr>
<td>Easiness</td>
<td>New instruments should be easy to use.</td>
</tr>
<tr>
<td>Effectiveness</td>
<td>Many changes, especially of instruments, improved the effectiveness of the business.</td>
</tr>
<tr>
<td>Efficiency</td>
<td>Many changes, especially of instruments, improved the efficiency of the business.</td>
</tr>
<tr>
<td>Experience</td>
<td>Experience facilitated the most important aspect of processes, teamwork, as with time people learnt what works for others.</td>
</tr>
<tr>
<td>Human Errors</td>
<td>Human errors made the work of others difficult and weakened cooperation.</td>
</tr>
<tr>
<td>Information</td>
<td>Exchange of information between dentists and other practitioners was required to provide a high level of patient care (customer service).</td>
</tr>
<tr>
<td>Instruments</td>
<td>New instruments had to be purchased to make use of the existing technology. Occasional problems however made work quite difficult (i.e. misleading HICAPS machine).</td>
</tr>
<tr>
<td>Integration</td>
<td>Instruments communicated with each other and made work more effective and efficient.</td>
</tr>
<tr>
<td>Interaction</td>
<td>People’s interactions were required to ensure good teamwork which was the most important aspect of the business process.</td>
</tr>
<tr>
<td>Knowledge</td>
<td>Knowledge helped in the most important aspect of processes: teamwork.</td>
</tr>
<tr>
<td>Learning</td>
<td>A dentist undertook regular courses required by the profession. Staff were sent by the dentist to useful training in their work (sterilisation, first aid).</td>
</tr>
<tr>
<td>Motivation</td>
<td>Motivation was only provided in the form of financial reward for the work; in a small business there were no other options.</td>
</tr>
<tr>
<td>Ownership</td>
<td>Small-business owner made all decisions and delegated the relevant tasks.</td>
</tr>
<tr>
<td>Physical Layout</td>
<td>Space layout was important in dentist work so changes were introduced for functional and aesthetical purposes.</td>
</tr>
<tr>
<td>Planning</td>
<td>Planning and preparation for every patient seen on the day took place in the morning.</td>
</tr>
<tr>
<td>Process Bypassing</td>
<td>Process bypassing could be a real problem for the business. For example, a nurse did not follow the end of day procedure and threw out valuable tools entangled in disposable rubbish.</td>
</tr>
<tr>
<td>Quality</td>
<td>The quality of patient records was improved by digitalisation.</td>
</tr>
<tr>
<td>Reasonableness</td>
<td>Rules had to protect different parties: patients (infection control) and employees (payroll). Some rules were useful but some were not and common sense was required.</td>
</tr>
<tr>
<td>Reliability</td>
<td>New instruments required backup as nothing was really 100% reliable.</td>
</tr>
<tr>
<td>Safety</td>
<td>A safety switch was installed to ensure patient safety.</td>
</tr>
<tr>
<td>Standardisation</td>
<td>Standardisation helped to perform the tasks and it was easier to remember and know what to do. &quot;If you have a system you will run a successful business.&quot;</td>
</tr>
<tr>
<td>Technology</td>
<td>New equipment and information systems improved the effectiveness and efficiency of the workplace.</td>
</tr>
</tbody>
</table>
### Table A4 2: Horizon of experience for C2.

<table>
<thead>
<tr>
<th>COMMON CODES</th>
<th>CONTEXT (IT, SMALL BUSINESS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automation</td>
<td>Automation improved collaboration between different parties within the process.</td>
</tr>
<tr>
<td>Capabilities</td>
<td>People capabilities determined if the systems were used and processes followed in the future.</td>
</tr>
<tr>
<td>Changes</td>
<td>Changes were needed to ensure that processes were effective and efficient, for example fixing the bottlenecks or implementing the system that could manage processes better.</td>
</tr>
<tr>
<td>Collaboration</td>
<td>Collaboration was important as people relied on others and non-team players made it all very difficult. It was facilitated by continuous communication and notifications from the integrated systems.</td>
</tr>
<tr>
<td>Communication</td>
<td>Communication should be monitored by management to ensure good collaboration.</td>
</tr>
<tr>
<td>Customer Service</td>
<td>Customer service had to be good to ensure that there is a business in the future.</td>
</tr>
<tr>
<td>Documentation</td>
<td>Systems should provide process documentation so process steps could be finalised without stakeholders’ complaints.</td>
</tr>
<tr>
<td>Effectiveness</td>
<td>Effectiveness was built into the processes through the functionality of information systems.</td>
</tr>
<tr>
<td>Efficiency</td>
<td>Efficiency was built into the processes through the use of complex systems. Occasionally adjustments had to be made when the bottlenecks were discovered.</td>
</tr>
<tr>
<td>Experience</td>
<td>Experience was gained through training or collaboration with others.</td>
</tr>
<tr>
<td>Flexibility</td>
<td>Flexibility gave people the power of decision-making but for low capability people had to be compromised as rigidity worked better.</td>
</tr>
<tr>
<td>Human Errors</td>
<td>Human errors were made due to a lack of relevant capabilities or training.</td>
</tr>
<tr>
<td>Information</td>
<td>Systems allowed a continuous exchange of information.</td>
</tr>
<tr>
<td>Integration</td>
<td>The integration of systems was required as multiple systems were often used and different parties had to communicate with each other.</td>
</tr>
<tr>
<td>Knowledge</td>
<td>Knowledge was gained through training or collaboration with others.</td>
</tr>
<tr>
<td>Learning</td>
<td>Learning was facilitated by good collaboration as people could pass the relevant knowledge and experiences to others. Training was frequently neglected as businesses looked for low costs. It was however essential as it provided knowledge on how to enact the processes.</td>
</tr>
<tr>
<td>Management</td>
<td>Management was a key to success through: planning usage of resources, assigning responsibilities, monitoring the collaboration and validation of the work, and motivating employees.</td>
</tr>
<tr>
<td>Meetings</td>
<td>Regular meetings facilitated collaboration as people passed their knowledge and learnt from each other.</td>
</tr>
<tr>
<td>Mobility</td>
<td>Information systems allowed people to enact the processes from anywhere in the world.</td>
</tr>
<tr>
<td>Monitoring</td>
<td>People’s work should be monitored by others to ensure good quality. Good performance should be rewarded and poor penalised.</td>
</tr>
<tr>
<td>Motivation</td>
<td>Motivation should be delivered by strong management through providing opportunities to succeed.</td>
</tr>
<tr>
<td>Ownership</td>
<td>Ownership should be clearly determined by management.</td>
</tr>
<tr>
<td>Planning</td>
<td>Planning was part of good management.</td>
</tr>
<tr>
<td>Power</td>
<td>Some subjects resisted changes and transparency as they were afraid to lose power.</td>
</tr>
<tr>
<td>Process Bypassing</td>
<td>Process bypassing was caused by a lack of knowledge on how to enact the process, which happened due to poor training; or by design not taking into account people’s low capabilities.</td>
</tr>
<tr>
<td>Quality</td>
<td>Work should be validated by others to ensure its quality.</td>
</tr>
<tr>
<td>Reasonableness</td>
<td>Rules applicable to processes should be a result of a compromise between opposing stakeholders.</td>
</tr>
<tr>
<td>Rigidity</td>
<td>Rigidity was required if people capabilities were low to ensure that the process was followed.</td>
</tr>
<tr>
<td>Stakeholders’ Conflict</td>
<td>Conflict was inherent in many processes as goals of various subjects differed. For example: effectiveness for the customers versus efficiency for the process designers; employer looking for low cost and employees looking for high salary.</td>
</tr>
<tr>
<td>Technology</td>
<td>Technology facilitated the effective and efficient operational side of the business.</td>
</tr>
<tr>
<td>Transparency</td>
<td>Transparency gave clear information on the work status and people involvement but was resisted by people who were afraid that process changes would decrease their power.</td>
</tr>
<tr>
<td>Trust</td>
<td>Trust was important as people relied on others’ work.</td>
</tr>
<tr>
<td>Visual Guidance</td>
<td>People preferred visual guidance on how to use the system over written manuals.</td>
</tr>
</tbody>
</table>
Table A4 3: Horizon of experience for C4.

<table>
<thead>
<tr>
<th>COMMON CODES</th>
<th>CONTEXT (BEAUTY SALON, SMALL BUSINESS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Changes</td>
<td>Changes had the potential to motivate employees when they were introduced to their suggestions.</td>
</tr>
<tr>
<td>Collaboration</td>
<td>Teamwork was not always important, for example beauty treatments are performed by one beautician. It may be stressful when your main job does not require teamwork but you are still expected to help others, for example clean up after hairdressers.</td>
</tr>
<tr>
<td>Communication</td>
<td>Communication was the second most important aspect of processes, after customer service. It often took place through technology which made processes more efficient.</td>
</tr>
<tr>
<td>Compliance</td>
<td>Rules that bring hefty fines for non-compliance were always followed, for example serving alcohol, or only certified people applying peroxide on scalps.</td>
</tr>
<tr>
<td>Customer Service</td>
<td>The customer being the most important in the process enactment could overwrite existing rules.</td>
</tr>
<tr>
<td>Easiness</td>
<td>Information systems supporting the process by storing basic information should be easy to use. When manual workaround was easier it would be used. For example, to pass a special request to the kitchen staff, a waitress went to the kitchen rather than enter it on the computer system which was visible to the kitchen staff on their screen.</td>
</tr>
<tr>
<td>Effectiveness</td>
<td>Effectiveness could be improved by using the appropriate instruments.</td>
</tr>
<tr>
<td>Efficiency</td>
<td>Efficiency could be improved by using the appropriate instruments and information systems. However, other than ensuring that other scheduled customer appointments were kept, efficiency was not important. The customer was paying for the experience and they were more important than efficiency considerations.</td>
</tr>
<tr>
<td>Human Errors</td>
<td>Errors caused frustration to others affected by them. For example, when a hairdresser apprentice double-booked a beauty treatment, the beautician had to deal with the dissatisfied customer who could not get the service they came for.</td>
</tr>
<tr>
<td>Information</td>
<td>Even though the core processes related to providing hair or beauty care, the information could make the job easier. For example, customer cards stored information on personal details and customers' type of skin, and a scheduler stored information on customer appointments.</td>
</tr>
<tr>
<td>Instruments</td>
<td>Some processes could not be performed without appropriate instruments (i.e. a UV lamp is required to set the nail gel before it is cured with a special product) and some were enacted more effectively (a steam machine opens the pores in your skin better than a hot towel) and efficiently (testers allow you to visually assess the skin faster).</td>
</tr>
<tr>
<td>Interaction</td>
<td>Regular dealings with customers could be difficult when they were upset, for example customers with traumatic experiences, customers that could not be served due to double-booking or instruments not working. Interaction with employees was frequent as everyone knew others well. As a result, people's attitudes on a specific day could strongly influence the atmosphere in the workplace (the personal problems of one demotivated others who were burdened with the issue).</td>
</tr>
<tr>
<td>Knowledge</td>
<td>Lack of knowledge could cause a customer harm and subject the business to lawsuits. Additionally some services were banned (rules) by authorities after frequent nail infections (e.g. cutting cuticles).</td>
</tr>
<tr>
<td>Language</td>
<td>The inability to communicate in the relevant language significantly disturbed the atmosphere in the workplace even when the employee provided good customer service.</td>
</tr>
<tr>
<td>Learning</td>
<td>Learning allowed you to obtain knowledge relevant to enacting the processes in the future. It happened through trade school, apprenticeships and workplace. Learning how to use technology (information systems) which was not the core work was quite stressful, especially when with upgrades it had to be done frequently. When a job involved frequent interactions with different customers the training should include basic psychology.</td>
</tr>
<tr>
<td>Motivation</td>
<td>Motivation was delivered through financial reward and atmosphere in the workplace although in a small company people knew each other quite well and the problems of one could negatively influence all the others. Finally people were also motivated when they had some say in the workplace, for example process changes introduced from employees' suggestions.</td>
</tr>
<tr>
<td>People Involvement</td>
<td>People experiences left them with knowledge relevant for process design and they should always be involved in possible process improvement. This also motivated them to work better.</td>
</tr>
</tbody>
</table>
**Interview 5**

Table A4: Horizon of experience for C5.

<table>
<thead>
<tr>
<th>COMMON CODES</th>
<th>CONTEXT (MINING AND SHIPPING, LARGE CORPORATION)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Changes</td>
<td>Changes were the order of the day so processes had to be constantly revisited (new technology, new regulations, or new political events). However, regular changes in regulations without giving the ship operators much time to implement them made the work very difficult.</td>
</tr>
<tr>
<td>Clarity</td>
<td>Relevant standards had to be clear as otherwise it was impractical to follow them.</td>
</tr>
<tr>
<td>Collaboration</td>
<td>In some cultures teamwork came naturally (Philippines) while in others decisions were taken and passed down without any collaboration.</td>
</tr>
<tr>
<td>Communication</td>
<td>Communication was crucial to ensure that the relevant information was passed on. It was facilitated by technology (teleconferencing systems) and influenced by culture (Australians flexible enough to work after hours to communicate with people in different time zones).</td>
</tr>
<tr>
<td>Compliance</td>
<td>Businesses operating around the globe had to follow a multitude of complex legislation issued by different bodies.</td>
</tr>
<tr>
<td>Culture</td>
<td>Cultural awareness was crucial when processes involved dealing with different nations (you could not get the ship through the Suez Canal unless the pilot received so many cigarettes).</td>
</tr>
<tr>
<td>Easiness</td>
<td>Systems supporting the processes should be intuitive and easy to use.</td>
</tr>
<tr>
<td>Effectiveness</td>
<td>Instruments used in the process had to be effective (ineffective nozzles did not help to fight fire on the ship).</td>
</tr>
<tr>
<td>Efficiency</td>
<td>Efficiency drove process changes (two new vessels purchased with highly efficient engines to gain a competitive advantage).</td>
</tr>
<tr>
<td>Experience</td>
<td>Experience brought knowledge on how to enact the processes and enabled monitoring younger team members so they did not compound their mistakes.</td>
</tr>
<tr>
<td>Flexibility</td>
<td>Systems supporting the processes should be flexible.</td>
</tr>
<tr>
<td>Human Errors</td>
<td>Errors could happen due to inexperience and seniors should monitor juniors.</td>
</tr>
<tr>
<td>Information</td>
<td>The complexity of shipping processes created a lot of information and systems supporting the storage, and access to it had to be specialised.</td>
</tr>
<tr>
<td>Instruments</td>
<td>Good instruments allowed effective and efficient shipping, good collaboration and exchange of information. When they did not work properly they caused frustration.</td>
</tr>
</tbody>
</table>
**COMMON CODES**  | **CONTEXT (MINING AND SHIPPING, LARGE CORPORATION)**
--- | ---
Integration  | **Systems** used within the process should be **integrated**. When allowances had to be processed separately, as a newly implemented SAP system could not cater for them, it made the job of the payroll department very difficult.
Knowledge  | **Knowledge** (of technology, other organisations involved in the processes, applicable **regulations** and customs, and the economic and political situation in specific world regions you want to operate in) was one of the most important aspects of the business processes enacted in the shipping division.
Language  | In some processes, such as contract negotiation, **translators** were employed to ensure that all requirements were clearly **understood**.
Learning  | Advances in **technology** required many employees to **learn** new solutions before they could be appropriated in the business.
Management  | **Management** should **motivate** people by understanding their drivers and offering them opportunities to work accordingly.
Meetings  | **Meetings** brought people closer together. Through **technology** they could be conducted even for teams in different parts of the globe.
Monitoring  | **More experienced** employees had their desks close to the less experienced so they could **monitor** their activity and help when needed.
Motivation  | People were **motivated** by different things and the **management** should take this into account when **scheduling** the work for team members.
Physical Layout  | **Space layout** was used to share **knowledge** between the employees (more **experienced** employees had desks around younger staff).
Power  | In some **cultures** hierarchy and the **power** that came with it were important (Korea) while in others they were not (Philippines).
Rigidity  | **Rigid systems** supporting the processes made work very **difficult**.
Safety  | As many business processes enacted on the ships involved hard manual labour, **safety**, often **regulated**, was an important concern (ship building was stopped in a Philippines shipyard due to safety concerns).
Stakeholders’ Conflict  | **Conflict** could arise especially with a clash of **cultures** (Koreans and Philippines).
Technology  | **Technology** had the potential to improve some aspects of the processes (**communication**) but care had to be taken as it could also make some processes more cumbersome (data entry in the new **SAP system**).
Transparency  | **Transparency** had the potential to improve some aspects of the processes but care had to be taken as it could also make some processes more cumbersome (the new **SAP system** allowed a **transparent** view of financial data but operational data entry became more difficult).
Variety  | A **variety** of **rules** around the globe and constant **changes** required careful **monitoring** to ensure **compliance**.

**Interview 6**

**Table A4 5: Horizon of experience for C6.**

| **COMMON CODES** | **CONTEXT (IT SECURITY, LARGE CORPORATION)** |
--- | --- |
Changes  | **Changes** were frequent as processes were very agile (product was released every eight hours), **documentation** was continuously updated and **systems** to store **information** upgraded. |
Clarity  | Organisation **rules** should be **clear** to avoid confusion about what to follow. |
Collaboration  | **Collaboration** was required across the globe as researchers from different countries were involved in the same process. With the number of people growing, **collaboration** was more difficult and processes had to be adjusted (code could only be checked after someone else reviewed it). **Collaboration** was adversely affected by the **performance review** system that introduced unhealthy competition among members of the same team. |
Communication  | **Communication** happened mainly through email as it was the most convenient tool across different time zones. Occasionally online **meetings** were used. A new form (Facebook type) with chats and subscriptions became popular but for C6 the majority of **information** there was not relevant. **Internal communication** failed quite often, however, due to the abundance of messages people did not have time to read. |
Cultural differences influenced how people dealt with the world. Some employees never questioned their managers even if the instructions were not clear or they were getting too high a workload. There were also differences in culinary traditions or clothes that were worn which could disturb the work of others.

Documentation facilitated training and people collaboration but was continuously updated and a multitude of versions were difficult to follow. For that reason it could not be printed but only used online so the newest version was read. With system upgrades, however, broken links were quite common and created problems.

Systems used for dealing with some processes were very inefficient and required a lot of unnecessary work. This was further augmented by the awareness that the same processes in other locations were very efficient (e.g. leave applications, expense claims in the US were efficient while in Australia were not).

Experience gave the best knowledge of the domain and should be shared with others during training sessions.

Flexibility in some processes led to poor quality (i.e. code review) and changes had to be introduced to make them more rigid.

Access to the relevant information was crucial and it was the first part of the new employee training. Online access was preferred due to constant updates but system upgrades caused broken links and were also a problem.

Lack of workstations available to new employees made work quite difficult.

System integration made processes much simpler. In the US, expense claims were integrated with Amex, while in Australia they were not and required a lot of manual work.

People interaction led to friendships and better collaboration in the future.

Specialised knowledge was required to enact the processes and should be documented so it could be shared within the organisation across the globe.

Learning was facilitated by open space as people learnt by osmosis. The best way to organise training was for senior staff to train juniors.

Some company-wide processes were considered by many as useless, and managers had to waste their time (inefficiency) chasing employees to follow them (yearly ethical reviews or performance reviews).

Face-to-face meetings were the best way for senior staff to train juniors and were organised so the employees could meet, learn and establish a base for better cooperation in the future.

Information systems allowed people to enact the processes from anywhere in the world.

Monitoring system faults around the world, 24 hours every day of the week, was the main service provided by the co-researcher’s team. Employee performance was evaluated once a year and bonuses were based on the result. Unfortunately the system was hated by the majority as it introduced unhealthy competition.

People were hugely demotivated by the performance review periodically ranking employees and assigning them to specific groups, which determined yearly bonuses. The majority of people were placed in the bottom groups even if they were extremely good workers. Morale budgets were provided to teams but they did not work well and people often did not attend the organised events.

It should be clear who is responsible for what, and who to contact when things break. This would avoid asking the wrong people to fix problems and wasting their time on something that is not part of their duties.

Open space facilitated collaboration (it was easier to communicate) and learning (by osmosis).

People bypassed processes they considered impractical, such as swiping a card to enter the premises during the morning peak hours when hundreds of people rushed through the door (it would force them to queue for a long time).

People bypassed processes considered impractical (swiping a card to enter the premises during the morning peak hours when hundreds of people rushed through the door) or a burden (yearly ethical online training).

Changes in the code became difficult when more employees worked on the same product. A code review process was established and every change had to go through a special approval procedure, which in turn improved quality.

To ensure quality some processes should be rigid, for example the code review.
### Interview 7

**Table A4 6: Horizon of experience for C7.**

<table>
<thead>
<tr>
<th>COMMON CODES</th>
<th>CONTEXT (BAKERY, SMALL BUSINESS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Challenge</td>
<td><strong>Challenge</strong> was the biggest motivator for C7.</td>
</tr>
<tr>
<td>Changes</td>
<td>Significant changes were introduced in equipment, customer service and employee training to ensure processes were more effective.</td>
</tr>
<tr>
<td>Collaboration</td>
<td>With large product quantities produced, some process subjects were not able to perform the required steps on their own, so teamwork was crucial. Those that were bad team players were dismissed.</td>
</tr>
<tr>
<td>Compliance</td>
<td>Selling food to the public required conforming to the existing food handling legislation and there were heavy fines for non-compliance.</td>
</tr>
<tr>
<td>Culture</td>
<td>A small number of employees (around 20) worked close together and there was no major ground for cultural differences, although occasional issues arose (e.g. an Indian lady refusing to take her earring out as to do so would be offensive to her culture, even though it was a company written policy created to keep customers safe).</td>
</tr>
<tr>
<td>Customer Service</td>
<td>Employees not meeting the standard had their employment terminated. Once a month the headquarters sent a mystery shopper to the store to write a report and evaluate the service quality.</td>
</tr>
<tr>
<td>Effectiveness</td>
<td>Significant changes were introduced in equipment, customer service and employees’ training to ensure processes were more effective.</td>
</tr>
<tr>
<td>Efficiency</td>
<td>Significant changes were introduced in equipment, customer service and employees’ training to ensure processes were more efficient.</td>
</tr>
<tr>
<td>Experience</td>
<td>The manager put herself on oven duties to ensure that she had experience in the process, gained the relevant knowledge and could train other employees.</td>
</tr>
<tr>
<td>Human Errors</td>
<td>Errors disturbed work and were annoying (installing new equipment took four months).</td>
</tr>
<tr>
<td>Information</td>
<td>Reliable information was required to evaluate how the business was going and to establish employee bonus entitlement.</td>
</tr>
<tr>
<td>Instruments</td>
<td>Highly advanced baking equipment was installed to improve the freshness of bread, and bakers’ start time was moved from midnight to 2 am. There were however problems with installation and it took four months to get it right.</td>
</tr>
<tr>
<td>Interaction</td>
<td>In a small team interaction was close. Occasionally negative interaction arose when an employee’s employment was terminated.</td>
</tr>
<tr>
<td>Knowledge</td>
<td>Specialised knowledge of not only the ingredients and steps but also how to adjust the process when the conditions changed was required to ensure consistent product quality.</td>
</tr>
</tbody>
</table>
**COMMON CODES** | **CONTEXT (BAKERY, SMALL BUSINESS)**
--- | ---
Learning | Employees *learnt* at the workplace during their apprenticeships and were participating in the company *training*. The training programme at headquarters was extensive and employees had to regularly participate in training if they wanted to be eligible for bonuses.
Management | The *manager* oversaw everything in the bakery and used the available tools (*information systems*) to determine areas for improvement.
Monitoring | An information system *measured* employees’ *sales* on which bonuses were based.
Motivation | Staff was *motivated* by salary and the incentive system based on the level of sales. Incentives were only available to employees who completed monthly online *training*.
Process Bypassing | When ingredients were delivered, employees were *approving* it *without checking* the list, and occasionally items were missing. This was a problem when it was discovered later and the ingredient required for baking was not available.
Quality | Product *quality* was the most challenging aspect of business processes and consistency could only be achieved with the relevant *knowledge* of the baking processes.
Rigidity | For less-experienced employees a *rigid* process ensured keeping product *quality* consistent.
Safety | The company established a Food Safety Programme incorporating existing food handling *legislation* and more to ensure the *safety* of the *customers*.
Satisfaction | Bakers’ *satisfaction* improved when their starting time changed from midnight to 2 am which could be achieved by installing new *equipment*.
Standardisation | Baking was *documented* by the *manager* and *flow charts* were created so the process could be *standardised* and *followed* by others to ensure consistent product *quality*.
Technology | Using the available *information system* contributed to an increase in sales as struggling employees could be identified and *trained* accordingly.
Visual Guidance | *Charts* were prepared by the *manager* for less-experienced employees so they could easily follow the processes.

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**Interview 8**

**Table A4 7: Horizon of experience for C8.**

**COMMON CODES** | **CONTEXT (NOT-FOR-PROFIT, MEDIUM SIZE ORGANISATION)**
--- | ---
Changes | Regular *changes* in processes were required to keep them *compliant* with existing *legislation*. While some changes made work difficult as they necessitated constant *learning*, others were very desirable, for example moving into new offices where *instruments* worked properly.
Collaboration | With limited resources, *collaboration* between people was very important. Many events were organised and different tasks had to be *shared* between employees (administrative work such as taking phone calls, scheduling, book keeping), sometimes even after work hours. There were however issues with *collaboration* between the executives and this made the work of the *manager* quite difficult.
Compliance | Reliance on government grants for funding the organisation’s activities required strict *compliance* with the relevant *regulations*. This was made difficult as the *legislation* constantly *changed*. When the external audit failed, the organisation had to introduce significant *changes* (appoint the manager, create strategic plans, the governance documents, risk management, and introduce the internal audit).
Culture | As the organisation serviced a mainly ethnic community, the *cultural* aspect became important. While the ethnic community was rather uniform (over 90% of people had one religion), when events were organised special attention had to be paid to minorities who practiced different religions and had different eating habits (e.g., no pork consumption).
Customer Service | *Unique services* provided by the organisation (age care in the ethnic community) made their services quite demanding. There were plans to expand the services to different geographical areas (currently operations were limited to the south-eastern suburbs) and increase their range (youth and women).
Documentation | Work had to be clearly *documented* for the audit trail (every *interaction* with *customers* recorded) and future references (*information* was missing on how much bond had been paid at the start of the lease).
<table>
<thead>
<tr>
<th>COMMON CODES</th>
<th>CONTEXT (NOT-FOR-PROFIT, MEDIUM SIZE ORGANISATION)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Efficiency</td>
<td>The requirement to follow some rules made processes very inefficient as a lot of time had to be spent on documenting the work, and this was rarely ever used.</td>
</tr>
<tr>
<td>Human Errors</td>
<td>Errors made work for others very difficult. For example, lease bonds paid over the years were recorded as ‘Other Expenses’ instead of ‘Asset’ and the organisation almost had to forgo this due to such incompetence.</td>
</tr>
<tr>
<td>Information</td>
<td>Information on customer interaction had to be stored to comply with the rules.</td>
</tr>
<tr>
<td>Interactions</td>
<td>Work with aged care required direct interaction with vulnerable people and it was important to maintain the employee–client relationship. Occasionally customers were calling care workers after hours and the policy of not giving staff private numbers to clients had to be introduced.</td>
</tr>
<tr>
<td>Instruments</td>
<td>Work was made really difficult when things did not work properly. Previously, the office was in the old city building (regular electricity blackouts; not enough data points; lack of a meeting room; lift frequently out of order (once 17 elderly customers were stuck in it and one of them suffered from shortness of breath). After moving recently to the new premises work became much easier.</td>
</tr>
<tr>
<td>Knowledge</td>
<td>Knowledge of people enacting the processes including clearly documenting such work was important as others had to rely on it in the future. For example, an old lease contract was signed in a way that forced the organisation to pay for refurbishing the office, which after 13 years of lease should be covered by the lessor.</td>
</tr>
<tr>
<td>Language</td>
<td>All employees and volunteers had to speak the ethnic language as many customers were elderly people who could communicate in English (some simply never learnt the language but others with dementia lost the ability to speak it).</td>
</tr>
<tr>
<td>Learning</td>
<td>With constant rule changes the employees and volunteers had to learn to keep up to date. Part of the regulations was regular monthly staff training provided by the organisation or other bodies. Some training was however not useful and wasted a lot of valuable resources that could be used in a better way. For example, coordinators meetings organised by the Department of Health and Ageing did not bring any real benefits.</td>
</tr>
<tr>
<td>Management</td>
<td>The manager had to coordinate the organisation’s activities and deal with employees and government bodies. In the past there was no manager and when the organisation failed the audit three years ago the position had to be created.</td>
</tr>
<tr>
<td>Meetings</td>
<td>Regular meetings improved collaboration as people were able to coordinate their work better. During some meetings organised by the Department of Health and Ageing the consultants came and talked without giving any practical examples, so people considered it a waste of time.</td>
</tr>
<tr>
<td>Monitoring</td>
<td>Employees’ and volunteers’ work had to be monitored and clients’ files checked regularly to ensure that the external audit would not fail.</td>
</tr>
<tr>
<td>Motivation</td>
<td>Employees and volunteers working for the organisation were usually enthusiastic about working with people in need. Resources were always limited but people were reimbursed for expenses incurred. They were also trained and the majority belonged to the ethnic community where the organisation worked.</td>
</tr>
<tr>
<td>Planning</td>
<td>The organisation was required to do strategic planning (governance documents, risk management, capital improvements) to ensure that there was a clear direction, and resources were allocated according to that direction. There was a lot of paperwork involved and it was considered by the manager as a burden.</td>
</tr>
<tr>
<td>Process Bypassing</td>
<td>Process bypassing could have serious effects for the organisation. When the audit discovered a lack of case notes the organisation had to restructure to continue its services.</td>
</tr>
<tr>
<td>Quality</td>
<td>Work had to be monitored to ensure quality and grants approval.</td>
</tr>
<tr>
<td>Reasonableness</td>
<td>Rule changes were made with not much advanced notice and minimal consultation with the industry. Additionally, there was a requirement to record every customer interaction, which was difficult with limited resources. Some rules could also be impractical, for example an Active Service Model forcing an 85-year-old to introduce life changes so they would be healthier in a year.</td>
</tr>
<tr>
<td>Reliability</td>
<td>Instruments had to be reliable as otherwise people were not able to do their job and were frustrated.</td>
</tr>
<tr>
<td>Satisfaction</td>
<td>Improvements in physical work facilities after moving into the new offices increased employees’ satisfaction as they didn’t have to deal with instruments that didn’t work. Additionally, the workplace became more pleasant.</td>
</tr>
<tr>
<td>Standardisation</td>
<td>Introduced changes and multiple governmental bodies issuing grants were the cause for the application of different rules to different clients. Work would be easier if one set of processes applied to all customers.</td>
</tr>
</tbody>
</table>
Technology

Internal information systems were used to store client information (audit requirement). MYOB software was used for accounting. There were future plans to purchase a specialised database for handling customer cases.

Variety

Work was made difficult with the application of different rules to different clients. This was due to the changes introduced and using grants given by different governmental bodies (federal and state).

Interview 9

Table A4 8: Horizon of experience for C9.

<table>
<thead>
<tr>
<th>COMMON CODES</th>
<th>CONTEXT (TIMBER INDUSTRY, MEDIUM SIZE ORGANISATION)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Changes</td>
<td>Many changes happened through time. Some, such as new technology which enabled constant communication with the office, were good, but others, such as the introduction of many safety rules, were too inefficient.</td>
</tr>
<tr>
<td>Collaboration</td>
<td>Salespeople regularly cooperated, often using mobile technology. They had to keep up to date with knowledge on products, prices and economy to make sales, and the exchange of information with other sales team members was the best way to achieve this.</td>
</tr>
<tr>
<td>Communication</td>
<td>Regular communication with work colleagues facilitated collaboration, often using mobile technology, and this helped to keep up to date with knowledge on products, prices and economy.</td>
</tr>
<tr>
<td>Compliance</td>
<td>In some cases there was no effective way of monitoring if the relevant guidelines were followed. The timber company used an aircraft motor instead of a kiln to dry timber and was selling structural grade, which was not meeting the grade requirement. As a result many houses had problems with the doorways. The company never ran into trouble.</td>
</tr>
<tr>
<td>Culture</td>
<td>Interacting with customers required participation in their cultural customs (when selling to the Turkish industry in Melbourne’s northern suburbs you had to drink black coffee before starting negotiations; after visiting 10 customers you had had 10 coffees). Different measurement units used around the globe added additional work to the processes (e.g. cubic metre versus super foot).</td>
</tr>
<tr>
<td>Customer Service</td>
<td>Customer service was important to ensure continuous sales. Frequently builders placed orders at the last minute and they could not be processed on time (a large order made Friday afternoon to be ready Monday morning). In such situations the salesperson personally made partial delivery of whatever could be organised so that the customer was not stuck with nothing.</td>
</tr>
<tr>
<td>Effectiveness</td>
<td>Paradoxically, effectiveness decreased in some cases by replacing people with machines, as people were able to visually grade timber better than the machines. As a result, current timber products were of lower grade than in the past when people had done the job.</td>
</tr>
<tr>
<td>Efficiency</td>
<td>Efficiency was required as business margins diminished due to timber prices being steady for the past 30 years while the consumer price index (CPI) constantly grew.</td>
</tr>
<tr>
<td>Experience</td>
<td>Experience allowed you to gain knowledge of the industry and the relevant processes necessary for a good salesperson. 90% of timber workers started from the ground up.</td>
</tr>
<tr>
<td>Information</td>
<td>Access to current information on stock availability and prices was provided by the existing systems and mobile technology.</td>
</tr>
<tr>
<td>Interaction</td>
<td>Frequent interactions with the customers made a salesperson the middleman. While they represented the business they also had to represent the customer. Interactions with people, talking to them and listening, gave great satisfaction. Close interaction between workers made employees feel more appreciated.</td>
</tr>
<tr>
<td>Instruments</td>
<td>Instruments were crucial to create the products ready for sale. Some equipment replaced human labour and made the processes more efficient but not always more effective.</td>
</tr>
<tr>
<td>Integration</td>
<td>Integration of mobile devices with the company database allowed the salespeople to be mobile and sell more as they could take orders at the customers’ sites.</td>
</tr>
</tbody>
</table>
The most important aspect of the sales process was knowledge of the industry and the products (not only the finished ones but where they came from and how they will be used), although product knowledge was gradually becoming less extensive (the number of timber species sold in Australia diminished as some were not allowed to be logged anymore). Dealing directly with the customer required also up to date knowledge on the products, prices and the market.

Language played an important part in communication, even when everyone was using English fluently. For example, the term “racking system” used in the timber industry in Australia is offensive in the US.

Learning in the timber industry happened most commonly through experience but some courses on timber technology and grading were available. People involved in timber products should understand exactly how to put things together, so there was a need to extend their training (a builder should know how a timberyard works).

Work involved pre-arranged meetings and cold calls to customers. Regular meetings within the sales team also took place to exchange knowledge on products and prices in different parts of the city.

Mobility was important in sales processes and face-to-face meetings were more effective than calls. Existing technology allowed constant communication with the office, so that stock levels could be checked.

Working for a family-owned company motivated people as interactions were close.

Frequent problems arose due to the biggest customer group (the builders) planning poorly and requesting big orders at the last minute when it was impossible to process them.

Some rules were unreasonable to the point that businesses were forced to replace the labour force with machines, as people became too inefficient following regulations. For example, when picking up six-metre long packs of timber and working them through different areas while stopping frequently, forklift drivers had to put the seat belt on every time they got into the vehicle.

Safety became overregulated to the point of making processes inefficient.

Work itself delivered great satisfaction even with extensive working hours (talking to people, listening to what they need).

Technology brought significant improvements in communication (previously the salesperson had to look for a phone booth to check the stock with the company; now they do it through the mobile device on the customer site) and increased customer interaction (previously many customers called the office directly rather than the salesperson).

To have the right people doing the work, who have capabilities and take ownership of their responsibilities, was essential. The organisation promoted the culture of respect and support and gave people the choice of projects.

The company offered unique professional opportunities (work with world-renowned brands and on the first ever products in the world). While it presented a challenge it was also stressful and some people resigned.

Changes were introduced to formalise design processes and use technology to manage them.

Collaboration was required to ensure that designers and customers were aligned in their pursuits. It often happened through communication (emails, online meetings, and regular face-to-face meetings). One person could not take responsibility for everything so when issues arose there was help and resources from others in the organisation.

Communication with customers was identified as the most important aspect ensuring the success of the processes. Due to location differences most communication
<table>
<thead>
<tr>
<th>COMMON CODES</th>
<th>CONTEXT (DESIGN ENGINEERING, MEDIUM SIZE ORGANISATION)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compliance</td>
<td>The organisation established a quality system that conformed to the applicable rules (ISO 9001 on a general quality system, ISO 13485 on development of medical devices, FDA Food rules, and ISO standards on risk management).</td>
</tr>
<tr>
<td>Culture</td>
<td>Cultural sensitivity was required when communicating with clients: how decisions were made, relationships formed. For example, a Dutch customer company with a democratic and transparent decision-making process was taken over by a French company with an autocratic and non-transparent decision-making process, and there were problems with adjusting to it. Culture could also vary among different nationalities, organisations, and positions (designers versus manufacturers). The organisation promoted the culture of respect and support of the employees to ensure that they were enthusiastic and took ownership of their work.</td>
</tr>
<tr>
<td>Customer Service</td>
<td>To ensure a high level of service, communication and the relationship with the customer were at the centre of the project. Additionally specifications were clearly documented so that after the project was finalised the validation could take place.</td>
</tr>
<tr>
<td>Documentation</td>
<td>Knowledge was very ethereal so if it was not documented it could disappear. Preparing documentation took time and may not have been that efficient, but without it the design could be ineffective. Clear documentation of specifications was also required so that validation, if the goals were achieved, could be performed.</td>
</tr>
<tr>
<td>Easiness</td>
<td>An information system that was not easy to use was discarded.</td>
</tr>
<tr>
<td>Effectiveness</td>
<td>As the organisation sold their employees’ time to the customers, efficiency was important, although it often conflicted with effectiveness.</td>
</tr>
<tr>
<td>Efficiency</td>
<td>As the organisation sold their employees time to the customers, efficiency was important, although it often conflicted with effectiveness.</td>
</tr>
<tr>
<td>Experience</td>
<td>Experience was crucial to designing a new product and dealing with problems when they arose.</td>
</tr>
<tr>
<td>Flexibility</td>
<td>The systems used had to be flexible so they could be easily customised to adapt to the specific project needs. The design process required great flexibility so that ideas could be tried.</td>
</tr>
<tr>
<td>Information</td>
<td>A large amount of information was created and used within the processes. Some was documented so that it could be referred to as knowledge or a base for validation if the goals were achieved.</td>
</tr>
<tr>
<td>Interaction</td>
<td>Interaction was very important as people collaborated better if they knew each other. The best was face-to-face contact so you could see everything around, co-workers, laboratory, issues and struggles; you could discover enormous amounts of information that would never be said in a formal teleconference meeting. That information was often the most important to achieving success. Interaction between employees was also encouraged and regular social events were organised (kayaking, team building, bike riding, etc.)</td>
</tr>
<tr>
<td>Instruments</td>
<td>Information systems had a great potential to manage and facilitate the design but they had to be flexible, easily customised to adapt to the specific project needs, and easily integrated with the commonly used applications.</td>
</tr>
<tr>
<td>Knowledge</td>
<td>Knowledge was crucial to designing a new product and dealing with problems when they arose. Technological knowledge enabled the design of the product, and product knowledge was created during the design process.</td>
</tr>
<tr>
<td>Learning</td>
<td>Learning was often required for every project, as a specific lab and technology would be used. Training was mandatory before any such lab could be accessed.</td>
</tr>
<tr>
<td>Management</td>
<td>Management had to coordinate the project, ensure that the specifications were clear and that validation could be performed.</td>
</tr>
<tr>
<td>Meetings</td>
<td>Online meetings were organised with customers from different countries but bandwidth had to be very good to ensure quality. Visual person-to-person contact was important as you could see the expressions on people’s faces and you could really connect with them, even if they were half a world away. At least every three months face-to-face meetings had to take place to ensure that customers and designers were aligned in their pursuits. Still some information was best obtained during informal gatherings.</td>
</tr>
<tr>
<td>Monitoring</td>
<td>Monitoring existing tensions was required (designing versus manufacturing).</td>
</tr>
<tr>
<td>Motivation</td>
<td>To motivate people the organisation offered them professional opportunities (to work with world-renowned brands and on the first ever products in the world) and a choice of projects (they could refuse projects ethically questionable to them, e.g. mouse traps). They felt being part of something bigger. The organisation also supported socialising events to motivate people as a team.</td>
</tr>
</tbody>
</table>
Ownership
To ensure that people took ownership of their work, the organisation promoted the culture of respect and support and gave them a choice of projects.

People Involvement
To manage conflicts between stakeholders they were involved in the projects together. For example, manufacturers were represented during the design phase to ensure that they had some say and that designers were aware of their point of view.

Quality
The organisation created its own quality system.

Rigidity
The manufacturing process required great rigidity so people had to follow this.

Safety
Gradual controls to improve work safety were introduced (a safety assessment for every machine that’s brought in, documenting safe handling procedures for any new chemical or biological substance, compulsory induction for any laboratory work).

Satisfaction
The culture of respect and support of the employees promoted by the organisation increased their satisfaction, professionally and humanly, and they worked more effectively and efficiently.

Stakeholders’ Conflict
Inherent conflict existed between designers (they required creativity and flexibility) and manufacturers (they required rigidity).

Standardisation
Dealing with new technology and a potential new product could only be properly managed when there was a set system/process that could be followed, for example defect tracking.

Technology
Technology was used excessively for collaboration but in some cases was frustrating (teleconferencing only worked with very high speed connections, otherwise the visual was too poor to use it).

Universality
Universal systems facilitated communication between parties (an expensive project design system had to be discarded after a few years as customers did not have it and documents still had to be converted and used in Word and Excel).

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Interview 12

Table A4 10: Horizon of experience for C12.

<table>
<thead>
<tr>
<th>COMMON CODES</th>
<th>CONTEXT (ELECTRICAL, LARGE CORPORATION)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Challenge</td>
<td>Every job was different and dangerous so it presented a challenge which for many was motivating.</td>
</tr>
<tr>
<td>Changes</td>
<td>The organisation looked to employees for proposed changes to the processes and their suggestions were regularly presented at the meetings.</td>
</tr>
<tr>
<td>Collaboration</td>
<td>Many processes required collaboration between electricians to ensure that the work was done effectively, efficiently and safely. When a specific instrument was under testing and not available, the employees shared the rest to ensure that work could be done.</td>
</tr>
<tr>
<td>Compliance</td>
<td>Many safety regulations were introduced for the better and compliance was very high. There were however some regulations that required unnecessary documentation and while they were followed people were annoyed with them.</td>
</tr>
<tr>
<td>Culture</td>
<td>People coming to the industry from foreign countries usually struggled as their training in the electrical industry was not as rigorous.</td>
</tr>
<tr>
<td>Customer Service</td>
<td>Customer satisfaction was important and the work had to be performed effectively and efficiently. The company rewarded cases when the customers called with positive feedback, by giving employees small incentives (cinema tickets).</td>
</tr>
<tr>
<td>Documentation</td>
<td>Documentation was required for every job, i.e. a risk assessment as part of safety regulations. Some was useful but some was considered a waste of time. Digital technology was brought in to improve effectiveness and efficiency in dealing with some aspects of the documentation.</td>
</tr>
<tr>
<td>Effectiveness</td>
<td>Due to the nature of the work being done, effectiveness was crucial as otherwise people or businesses would not have electricity.</td>
</tr>
<tr>
<td>Efficiency</td>
<td>Due to the nature of the work being done, efficiency was crucial as otherwise people or businesses would not have electricity. However, efficiency was decreased by the bureaucratic aspects of the job.</td>
</tr>
<tr>
<td>Experience</td>
<td>Knowledge and skills were required and they could be obtained through experience.</td>
</tr>
<tr>
<td>Instruments</td>
<td>Instruments used nowadays are much safer than in the past and more efficient (information systems). They are also regularly tested.</td>
</tr>
<tr>
<td>COMMON CODES</td>
<td>CONTEXT (ELECTRICAL, LARGE CORPORATION)</td>
</tr>
<tr>
<td>-------------</td>
<td>----------------------------------------</td>
</tr>
<tr>
<td>Interaction</td>
<td>In most cases people worked well together but occasionally a clash of characters occurred. Employees of different ages were mixed to ensure better effectiveness and efficiency.</td>
</tr>
<tr>
<td>Knowledge</td>
<td>Knowledge was required and it could be obtained through good training and experience.</td>
</tr>
<tr>
<td>Language</td>
<td>People coming to the industry from foreign countries usually struggled as their professional language was not as good.</td>
</tr>
<tr>
<td>Learning</td>
<td>Learning was the second most important aspect of processes. The company organised regular yearly training related to safety (first aid) and specialised training for any new equipment. The wish was however to extend the training to cases with fatalities. When such accidents happened the emergency crews could not deal with the bodies as the area was unsafe and electricians had to work with fatalities in sight.</td>
</tr>
<tr>
<td>Meetings</td>
<td>The company organised regular meetings (every five weeks) to encourage collaboration and ensure that people were listened to and any issues resolved.</td>
</tr>
<tr>
<td>Monitoring</td>
<td>Electrical maintenance work was checked by special auditors. Due to the nature of the work being done effectiveness and efficiency were crucial, so the KPI was being calculated for each job.</td>
</tr>
<tr>
<td>Motivation</td>
<td>Employees were motivated by high financial rewards especially for on-call work. There were also possibilities for advancement within the company. A variety of work in different places kept the job interesting, and gratitude from customers motivated people to work. Occasionally customers were quite unfriendly and angry that the power was off, and this could be demotivating. Some however called the office and thanked them for a job well done, and employees received a small incentive in such cases (i.e. cinema tickets).</td>
</tr>
<tr>
<td>People Involvement</td>
<td>During regular meetings people had a chance to suggest changes, which motivated them and also improved processes as they were familiar with them.</td>
</tr>
<tr>
<td>Physical Layout</td>
<td>As work was done outdoors, the physical layout of the sites determined the way the job was being performed. In some cases it was the cause of the exception (bypassing the standard). For example, a new pole could not be put on the existing concrete block and had to be moved somewhere else.</td>
</tr>
<tr>
<td>Planning</td>
<td>Some non-fault jobs had to be carefully planned to ensure minimum disturbance to the public. For example, maintenance which required cutting the power off in a shopping centre had to be done after hours.</td>
</tr>
<tr>
<td>Process Bypassing</td>
<td>Process bypassing did not really happen as trying to shortcut a process would make it harder and ineffective, and in the end it would cost more time and money as employees would have to come back. Occasionally the standards were bypassed when an obstruction existed but it was an exception allowed under the regulations.</td>
</tr>
<tr>
<td>Reliability</td>
<td>Instruments had to be reliable and all of them were tested every 6-12 months.</td>
</tr>
<tr>
<td>Rigidity</td>
<td>The majority of electrical work was done by rigidly following standards, with rare circumstances when the physical layout of the space forced exceptions.</td>
</tr>
<tr>
<td>Safety</td>
<td>The most important aspect of the processes was safe work (many accidents with fatalities happened in the 1980s). Current regulations made it mandatory to wear protective clothing, creating a barrier, and to use a harness when working on a pole. Also a maximum shift time was introduced to ensure that people were not too fatigued.</td>
</tr>
<tr>
<td>Satisfaction</td>
<td>Getting the power back on (after a big storm for people who have been off supply for many hours, and seeing the kids jumping because the TV was back on) was a very satisfying experience and gave the employees a feeling that there was a purpose to what they did.</td>
</tr>
<tr>
<td>Technology</td>
<td>Digital technology was brought in to improve effectiveness and efficiency in dealing with documentation. Information systems used for job scheduling became more efficient over the years but there were regular problems when the system was being upgraded.</td>
</tr>
</tbody>
</table>
Interview 13

Table A4 11: Horizon of experience for C13.

<table>
<thead>
<tr>
<th>COMMON CODES</th>
<th>CONTEXT (TECHNICAL ENGINEERING, MEDIUM SIZE ORGANISATION)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automation</td>
<td>The sales quotation system was automated so the quotations could be created quicker and more accurately.</td>
</tr>
<tr>
<td>Changes</td>
<td>Changes were introduced to make processes more effective and efficient.</td>
</tr>
<tr>
<td>Collaboration</td>
<td>In a relatively small company (25 employees), collaboration between people was easier and people were willing to help others by doing jobs that were not within their scope of work.</td>
</tr>
<tr>
<td>Communication</td>
<td>The most effective communication with the client happened face-to-face. Phone conversations rarely got the results.</td>
</tr>
<tr>
<td>Customer Service</td>
<td>Products offered by the business were technically complex and quite expensive. Sales were therefore not high in volume and there was often an extended period of time before the order took place. Interaction with the customers was extremely important and all had to be done to ensure their satisfaction. New technological advancements were followed so they could be offered to the customer.</td>
</tr>
<tr>
<td>Easiness</td>
<td>Information systems should be simple to use as otherwise people would be inclined to reject them.</td>
</tr>
<tr>
<td>Effectiveness</td>
<td>Better accuracy was achieved by automating the quotation system.</td>
</tr>
<tr>
<td>Efficiency</td>
<td>Time was saved by automating the quotation system. Information systems should be quick to use as otherwise people would be inclined to reject them. The language barrier caused some inefficiency in the processes as the only English speaking person in a Chinese factory was always busy and it took time to get the answers to technical questions asked by some potential customers.</td>
</tr>
<tr>
<td>Experience</td>
<td>Working with the product could give you the required knowledge if you were enthusiastic about learning it.</td>
</tr>
<tr>
<td>Information</td>
<td>Correct technical and pricing information was crucial for the customer and changes were introduced to automate the quotation process.</td>
</tr>
<tr>
<td>Instruments</td>
<td>Instruments should work fast and be easy to use and provide the required functionality.</td>
</tr>
<tr>
<td>Interaction</td>
<td>Interaction with the customers was extremely important and all had to be done to ensure their satisfaction during the extended period of negotiations. The company organised some social events to motivate people to be part of the team and work well, although C13 believed they should do more.</td>
</tr>
<tr>
<td>Knowledge</td>
<td>As the company sold technical equipment, knowledge was the most important aspect of processes; without it the work could not be done properly. Customers asked specific questions about the product and you had to be able to answer them.</td>
</tr>
<tr>
<td>Language</td>
<td>As the company imported the goods from a Chinese factory, communication with the manufacturing engineers was important. Language caused serious issues as the only person that could speak English was usually very busy. Also, American English which many foreigners spoke sometimes caused misunderstandings.</td>
</tr>
<tr>
<td>Learning</td>
<td>To ensure that new technological developments could be applied to provide a competitive advantage and ensure employees were motivated, the organisation offered training to the employees. They had to be proactive about it though.</td>
</tr>
<tr>
<td>Meetings</td>
<td>The hardest part of the job was to get a face-to-face meeting with the prospective client, and this was the most effective way of selling sophisticated and expensive equipment. When they saw something for real (warehouse, products, you as a person), the impression left on their mind was much different.</td>
</tr>
<tr>
<td>Motivation</td>
<td>Opportunities for training and also social events were how the organisation motivated people to be part of the team and work well.</td>
</tr>
<tr>
<td>People Involvement</td>
<td>People should be involved in process design as they were the ones that knew the business best. Without that knowledge, processes would have problems.</td>
</tr>
<tr>
<td>Physical Layout</td>
<td>Physical layout influenced the efficiency of processes (the layout of the manufacturing floor) and effectiveness (face-to-face meetings with work colleagues were more effective but if their offices were far away you may have decided to call them instead).</td>
</tr>
<tr>
<td>Process Bypassing</td>
<td>When the processes were impractical they were often bypassed. For a contractor, obtaining everyday permission to work on the factory premises was too impractical. As they were often for many consecutive days, after some time they started to bypass the process.</td>
</tr>
</tbody>
</table>
| Reasonableness | When rules were unreasonable they were broken. Every visitor to the Australian factory had to pass the induction session, which provided too much information and lasted 45
<table>
<thead>
<tr>
<th>COMMON CODES</th>
<th>CONTEXT (TECHNICAL ENGINEERING, MEDIUM SIZE ORGANISATION)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reliability</td>
<td>Instruments (i.e. information systems) should be reliable and work fast and every time.</td>
</tr>
<tr>
<td>Rigidity</td>
<td>People wanted something that was easy, simple, rigid, worked every time, and worked fast. In some processes rigidity ensured effectiveness and efficiency. For example, when preparing sales quotations the relevant and accurate information had to be provided, so new templates were introduced and rigidly controlled data entry.</td>
</tr>
<tr>
<td>Technology</td>
<td>IT was used to automate the quotation process, which improved customer service and made the process more effective and efficient. New technological developments could provide a competitive advantage so employees were encouraged to learn it. There should however be future benefits to the employees. For example, people were not keen to learn custom-built software which was very user unfriendly and not universally known.</td>
</tr>
<tr>
<td>Universality</td>
<td>Tools used within the process should be universally used. For example, information systems such as Excel were good as you could create documents and everyone was able to read them. It was also much easier to use a system that was universal as the chances were that many employees knew it.</td>
</tr>
</tbody>
</table>

**Interview 14**

**Table A4 12: Horizon of experience for C14.**

<table>
<thead>
<tr>
<th>COMMON CODES</th>
<th>CONTEXT (MANUFACTURING, MEDIUM SIZE ORGANISATION)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automation</td>
<td>Whenever possible steps in the processes should be automated to ensure effectiveness and efficiency.</td>
</tr>
<tr>
<td>Changes</td>
<td>Regular changes in technology introduced new instruments and required training in how to operate them.</td>
</tr>
<tr>
<td>Collaboration</td>
<td>Teamwork did not play a significant role as the machinist worked on their own from the time they received a work order. Only when issues arose, verbal communication with management was required.</td>
</tr>
<tr>
<td>Communication</td>
<td>Machinists were mostly individualists and verbal communication happened with management only when issues arose (e.g. there were not enough tools to make the order).</td>
</tr>
<tr>
<td>Effectiveness</td>
<td>Relevant knowledge and experience made the processes more effective.</td>
</tr>
<tr>
<td>Efficiency</td>
<td>Relevant knowledge and experience made the processes more efficient. In the current economic environment with cheap labour in China, the efficiency of the work was extremely important. Efficiency went hand in hand with organising work and proper knowledge of the management. Efficiency could be improved by more extensive utilisation of information technology and automation.</td>
</tr>
<tr>
<td>Experience</td>
<td>Experience was important as it determined how a specific person could be utilised. Lack of experience made the work ineffective and inefficient.</td>
</tr>
<tr>
<td>Information</td>
<td>The existing information should be available for every system used within a process to ensure efficiency. When machines were not integrated people wasted time setting up work orders that could not be performed as there were not enough tools.</td>
</tr>
<tr>
<td>Instruments</td>
<td>As technology continuously advanced, keeping up to date with the changes was required. Instruments should be integrated and use the available information so processes were efficient.</td>
</tr>
<tr>
<td>Integration</td>
<td>Data existing in some machines could be used by other machines before work orders were released. This would increase efficiency as there would be no more time wasted on orders that could not be processed anyway, and no more frustrated employees.</td>
</tr>
<tr>
<td>Interaction</td>
<td>Due to limited collaboration, interacting with people was not frequent. Other people seemed to be a disturbance rather than a help, and working night shifts was a preferable option.</td>
</tr>
<tr>
<td>Knowledge</td>
<td>Knowledge was important as it determined how a specific person could be utilised. A lack of knowledge made the work ineffective and inefficient.</td>
</tr>
<tr>
<td>Language</td>
<td>There was a rule that everybody had to speak English even at break time just out of fear that somebody was talking about someone in a different language. There were even complaints when during the break people talked to their non-English speaking wives on the phone.</td>
</tr>
</tbody>
</table>
Learning technologies required constant learning and keeping up to date with new solutions. Usually the equipment vendor provided the required training.

Management planned the usage of resources and their knowledge was very important. One of the biggest problems in C14's work was management not being knowledgeable enough to solve the problems that appeared from time to time on the job. As a result, work effectiveness and efficiency suffered.

Dividing work between employees could make work easier but at the same time could demotivate employees as they felt less valuable. Financial remuneration was a big motivator but the company should do more. For example, incentives should be offered when people gave feedback that was used to improve the process. Currently requests for suggestions had no response as in the past people wasted their effort and C14 was never acknowledged.

People should be involved in process design and improvement but they had to be motivated to do it. The company asked for suggestions but did not acknowledge them and did not offer any incentives, so people stopped doing it.

When people were not motivated they did not engage themselves and did not own their work.

Some steps in the manufacturing process had to be performed in specific environmental conditions, i.e., a temperature-controlled environment, so the working floor had to be isolated.

Planning was an important part of management's job which ensured effectiveness. It could only be done properly when management had the appropriate knowledge and experience.

Inefficient processes made employees occasionally bypass them. For example, referring the program back to the programmers for adjustment was just too cumbersome, so the machinists with programming knowledge were fixing the problems themselves.

As a lack of instruments could halt the manufacturing process it was important to ensure that there was always appropriate backup.

The majority of organisational rules were based on common sense so there were no issues with them (e.g., not talking on the phone during work unless it was an emergency).

All machines were safe as they would only operate once they were properly closed.

Satisfaction often depended on age:
* young people (20-30) wanted challenge and skills improvement so preferred big organisations;
* middle-aged people had knowledge and experience and were interested in higher financial rewards even at the cost of job stability, so preferred smaller organisations;
* older people (50+) did not want long working hours, so preferred job stability in big organisations.

Continuous advances in technology required constant learning and keeping up to date with the relevant solutions.

Interview 15

Table A4 13: Horizon of experience for C15.

<table>
<thead>
<tr>
<th>COMMON CODES</th>
<th>CONTEXT (MANUFACTURING, MEDIUM SIZE ORGANISATION)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Changes</td>
<td>Changes should only address real issues. People became frustrated when things worked well and changes were made just for the sake of change.</td>
</tr>
<tr>
<td>Clarity</td>
<td>It was very frustrating when there were no clear guidelines, and things were changed at the last minute. In western cultures nowadays all reports had to be written in a positive language, which could mislead the parents. For example, when a student was lazy you could not write that down but had to phrase it that he needed to do more work.</td>
</tr>
<tr>
<td>Collaboration</td>
<td>Collaboration with others depended on the specifics of work. In the bank, employees competed with each other but still cooperated well. In the school, collaboration made the job easier for everyone so it was more personal. Unfortunately employees formed cliques which was unhealthy, as they had agendas and supported changes if they were proposed by someone from their group rather than because the changes were good.</td>
</tr>
<tr>
<td>COMMON CODES</td>
<td>CONTEXT (EDUCATION, MEDIUM SIZE ORGANISATION)</td>
</tr>
<tr>
<td>-------------</td>
<td>---------------------------------------------</td>
</tr>
<tr>
<td>Communication</td>
<td>Lack of communication created unnecessary tensions and problems, and minor issues became bigger. For example, the head of the geography department did not communicate some requirements to one of the teachers, and as a consequence the children were not prepared for the exam.</td>
</tr>
<tr>
<td>Compliance</td>
<td>Rules that were not reasonable were often not complied with unless the penalties were too severe to risk it. For example, a male teacher could not take on an excursion a group of children where there was even one girl.</td>
</tr>
<tr>
<td>Culture</td>
<td>Technology introduced cultural changes in our society and transformed children to be more worldly and knowledgeable, and teachers dealt with them on a more equal basis than in the past. In a multicultural environment it was important to learn the basic differences in cultures. For example, in South Africa, for black children it was impolite to look at someone when they spoke, while for white children not looking was considered impolite.</td>
</tr>
<tr>
<td>Easiness</td>
<td>Many processes (booking the training, getting stationery) were easy to follow and teachers were happy with all the support they got from the school.</td>
</tr>
<tr>
<td>Effectiveness</td>
<td>The only thing that mattered was the results at the end of Year 12, and if they were good the targets were met.</td>
</tr>
<tr>
<td>Efficiency</td>
<td>Technology brought efficiency as preparation and running classes were less time-consuming (no need to set up the projector if every student had a laptop).</td>
</tr>
<tr>
<td>Instruments</td>
<td>Instruments were a great teaching aid (laptop).</td>
</tr>
<tr>
<td>Integration</td>
<td>Technological tools should be integrated well. The IT department had regular problems when students had personal iPads and needed to save their files on the school Windows-based network. The decision was made to go to personal Windows-based tablets to ensure that all systems easily talked to each other.</td>
</tr>
<tr>
<td>Interaction</td>
<td>Intensive interaction took place with the students every day and it was often one of the job’s motivating factors. Additionally, interaction with work colleagues was required to ensure that they followed the same curriculum and school objectives.</td>
</tr>
<tr>
<td>Knowledge</td>
<td>Knowledge to be passed to children continuously changed so the teachers needed to be up to date, and regulations required them to have 100 hours of professional training in every five years.</td>
</tr>
<tr>
<td>Learning</td>
<td>Teachers had to do 100 hours of development within every five-year period to ensure that their knowledge was up to date. School supported the teachers, and once a specific conference was identified the administrative staff organised all the required paper work.</td>
</tr>
<tr>
<td>Management</td>
<td>Management was an important aspect of every job as it included planning and people became frustrated with last-minute changes. Management should coordinate things and be organised so people’s jobs were easier.</td>
</tr>
<tr>
<td>Meetings</td>
<td>Meetings facilitated communication. Regular meetings in the science and history departments ensured that all teachers were aware of the teaching requirements. At the same time a lack of meetings in the geography department caused problems.</td>
</tr>
<tr>
<td>Motivation</td>
<td>Teaching required many additional hours of work and preparation so teachers were usually people motivated by working with kids and seeing their improvements. Additional inspiration was provided by the kids’ results and behaviour, which in C15’s organisation were exceptionally good. The biggest motivation was provided by feeling appreciated and when the organisation facilitated your work as much as possible, even with little things like stationery.</td>
</tr>
<tr>
<td>Planning</td>
<td>The important aspect of every job was planning, as people became frustrated with the last-minute changes.</td>
</tr>
<tr>
<td>Process Bypassing</td>
<td>People tended to bypass processes that were impractical and unreasonable.</td>
</tr>
<tr>
<td>Reasonableness</td>
<td>When rules were unreasonable people were frustrated and often broke such rules. For example, when the loan manager refused a loan on some technicality the branch manager approved it even though he did not have any authority. Impractical rules were often bypassed. For example, in the construction industry some safety requirement slowed the work too much and people disregarded them.</td>
</tr>
<tr>
<td>Safety</td>
<td>Work safety rules were bypassed when they were impractical.</td>
</tr>
<tr>
<td>Satisfaction</td>
<td>Interaction with kids, watching them growing and developing, brought satisfaction to the teachers.</td>
</tr>
<tr>
<td>Technology</td>
<td>Technology was crucial as it made everyone’s job easier. For example, laptops allowed students to see clearly the relevant images and saved the teacher time in setting up the projector.</td>
</tr>
</tbody>
</table>
### Table A4 14: Horizon of experience for C16.

<table>
<thead>
<tr>
<th>COMMON CODES</th>
<th>CONTEXT (ACCOUNTANCY, EDUCATION, MEDIUM SIZE ORGANISATION)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capabilities</td>
<td>People’s capabilities had to be taken into account when processes were designed or adjusted, to mitigate resistance to those changes. If people did not have capabilities, there should be an opportunity for them to be educated.</td>
</tr>
<tr>
<td>Changes</td>
<td>Changes happened quickly when new technology had to be implemented for the benefit of the students but they were very slow in administration.</td>
</tr>
<tr>
<td>Collaboration</td>
<td>Some roles were fairly autonomous but they still required some collaboration (to manage receivables from families, the most up-to-date list of students from a registrar was required).</td>
</tr>
<tr>
<td>Compliance</td>
<td>While different rules were applicable in the workplace they usually did not present major problems, partly because C16 was brought into a fairly compliant Irish culture. Occasionally when the rules were not followed by others and this impacted C16’s job, there were always superiors that could be referred to.</td>
</tr>
<tr>
<td>Culture</td>
<td>Cultural changes in the school area were visible. With more multicultural families sending their children to the school the processes had to change. For example, payments were often made in cash rather than by card (Chinese families) or they were made monthly rather than quarterly (Indian families). C16 came from an Irish culture which was typically fairly compliant and following rules applicable in the workplace did not present major problems.</td>
</tr>
<tr>
<td>Efficiency</td>
<td>Many processes were inefficient, as manual work had to be done due to the systems being old and not supporting steps that well. The biggest wish was access to much more complex computer systems and technology. There was also duplication of work.</td>
</tr>
<tr>
<td>Experience</td>
<td>To be able to do the job well, accountants required technical accounting knowledge, usually gained through the university and experience obtained through years of practice.</td>
</tr>
<tr>
<td>Information</td>
<td>Managing receivables required dealing with customer information. As the system was old, entering such information was often cumbersome and frustrated the accountant.</td>
</tr>
<tr>
<td>Instruments</td>
<td>A better computer system was wished for to make processes less cumbersome.</td>
</tr>
<tr>
<td>Interaction</td>
<td>The best way to ensure that collaboration was good was to organise events outside work where people could meet and socialise. Such events should come from the staff rather than management to ensure people’s participation. People could bond by living through difficulties together. The most enjoyable working environment was in a company that was in financial difficulties and eventually went bankrupt.</td>
</tr>
<tr>
<td>Knowledge</td>
<td>Technical accounting knowledge was usually gained through university. Experience however provided you with the tacit knowledge. People’s knowledge had to be taken into account when processes were designed or adjusted to mitigate resistance to those changes. If required, necessary training had to be provided so people gained such knowledge.</td>
</tr>
<tr>
<td>Language</td>
<td>Due to many parents not speaking English the issues had to be discussed in the presence of the student who acted as a translator. It added some complexity to the processes and increased the time involved in managing the specific family’s account.</td>
</tr>
<tr>
<td>Learning</td>
<td>When people had worked for a long time it was hard for them to approve the change even if it made processes more efficient. The necessary training should be provided to mitigate such resistance. The school environment did not encourage admin staff to learn and people had to be proactive.</td>
</tr>
<tr>
<td>Management</td>
<td>Management had to coordinate the work of others and ensure that people were trained properly and embraced any changes that were happening for the benefit of the organisation. They should not abuse their power though by asking employees to break the rules.</td>
</tr>
<tr>
<td>Motivation</td>
<td>The big corporate world tended to be more impersonal, so a small school with more personal relationships was more motivating.</td>
</tr>
<tr>
<td>Ownership</td>
<td>Without input in the process design from the person who was the end user, enthusiasm could not be built. Engagement and the feeling of empowerment resulted in people owning the process as it was a better process for them in the end.</td>
</tr>
<tr>
<td>People Involvement</td>
<td>People had to be involved in process changes so they could bring their knowledge and create a better process for them. It produced a better outcome as there was understanding of what was actually happening at the coalface as opposed to what some of the designers of processes perceived was happening.</td>
</tr>
<tr>
<td>COMMON CODES</td>
<td>CONTEXT (ACCOUNTANCY, EDUCATION, MEDIUM SIZE ORGANISATION)</td>
</tr>
<tr>
<td>----------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Physical Layout</td>
<td>The physical layout of the workspace influenced the work. For example, an isolated office limited learning and collaboration as people did not interact with each other and exchange relevant information, so as to be aware of what was happening around. Additionally, sitting with her back to the door made C16 unaware if someone was coming into the office, and private information could be read behind her back on her screen.</td>
</tr>
<tr>
<td>Process Bypassing</td>
<td>Difficult situations arose when management asked to bypass the processes and issue a fictitious invoice.</td>
</tr>
<tr>
<td>Satisfaction</td>
<td>A slower pace of work could increase your satisfaction but it could also be frustrating (people had to get used to it and also it would be hard to switch back to a commercial environment in the future). The school environment was local to the community where C16 lived so there was much more satisfaction in the relationships because they were notably outside of school which brought great satisfaction, a permanency that it was not just a job but part of a lifestyle.</td>
</tr>
<tr>
<td>Security</td>
<td>Due to the nature of work in receivables, managing information on specific families should be secured. Sitting with her back to the door however made C16 unaware if someone was coming into the office, and private information could be read behind her back on her screen.</td>
</tr>
<tr>
<td>Technology</td>
<td>The biggest problem at work was that technology that could make the job easier was not implemented. As a result a lot of work had to be done manually.</td>
</tr>
</tbody>
</table>