

**The Role of Business Domain Knowledge of Business Analysts
in the Acquisition and Communication of Client Requirements
in Information Systems Development (ISD) Projects**

Aishvarya Gunasekar

**A dissertation submitted to the Auckland University of Technology in partial
fulfilment of the requirements for the degree of Master of Business (MBus)**

2021

Department of Business Information Systems

Primary Supervisor: Dr Maduka Subasinghage

Secondary Supervisor: Dr Antonio Diaz Andrade

Abstract

Business domain knowledge of business analysts plays an important role in acquisition of client requirements and communication of requirements to the team in information systems development (ISD) projects. While working as a business analyst, I came to know from other business analysts that they had difficulties in handling some projects due to lack of domain knowledge. These conversations stimulated my interest to conduct this study to better understand role of business analysts' domain knowledge in acquisition and communication of requirements.

The review of literature provided the theoretical foundation for my study by showing that business analysts' domain knowledge is crucial to acquire client requirements and transforming those requirements into accurate requirements prescriptions. The literature also showed that business analysts' domain knowledge helps them to communicate the requirements effectively to internal software teams and client stakeholders for a shared understanding of the problem domain.

The study was conducted at Auckland, New Zealand and involved eliciting the perceptions of ten business analysts on the role of business domain knowledge in acquisition and communication of requirements. The participants' responses were obtained through semi-structured interviews. A deductive approach was used in the thematic analysis of participants' responses, duly utilising the theoretical foundation provided by the literature review.

The thematic analysis resulted in the emergence of four themes - business domain knowledge, requirements acquisition, communication of requirements and domain knowledge vs soft skills - with their respective sub-themes.

The main theoretical implications of the study is that business analysts should first gain sufficient business domain knowledge before the requirements acquisition process as the knowledge is crucial for them to gain the clients' trust, clearly understand client's needs and develop accurate requirements prescriptions documents. The study had also shown that business analysts should improve their domain knowledge for effective communication of requirements to the internal development team as well as to create a shared understanding of requirements by clients and developers.

The practical implication of the study for business analysts is that they should on their own gain sufficient business domain knowledge, through all means, for example, by self-learning or approaching subject matter experts (SMEs). The implication for ISD organisations is that they should support business analysts to gain domain knowledge through training courses, providing SMEs, and establishing well-maintained knowledge repositories.

Keywords: Business domain knowledge, communication of requirements, requirements acquisition, soft skills

Table of Contents

Abstract.....	i
List of Figures	iv
List of Tables	v
Attestation of Authorship.....	vi
Acknowledgements	vii
Chapter 1 Introduction	1
1.1 Background	1
1.2 Research problem and rationale.....	2
1.3 Research questions and objectives	2
1.4 Methodology	2
1.5 Outline of the dissertation	3
Chapter 2 Literature review	4
2.1 Introduction	4
2.2 Information Systems Development process	4
2.2.1 Domain engineering	4
2.2.2 Requirements engineering.....	5
2.2.3 Software design	6
2.3 Business domain knowledge	8
2.3.1 Dimensions of knowledge	9
2.4 Knowledge management process	10
2.4.1 Requirements acquisition phase	11
2.4.1.1 Role of business domain knowledge of business analysts in requirements acquisition.....	12
2.4.2 Communication of requirements prescriptions	15
2.5 Conceptual foundation for my research.....	16
Chapter 3 Methodology	17
3.1 Introduction	17
3.2 Research paradigm	17
3.3 Research methodology	17
3.3.1 Sampling and recruitment	17
3.3.2 Interview details and background information of participants.....	18
3.3.3 Data collection: Semi-structured interviews	19
3.3.4 Data analysis method: thematic analysis.....	19
3.4 Ethical considerations.....	24
Chapter 4 Findings	25
4.1 Introduction	25
4.2 Business Domain knowledge.....	27
4.2.1 Domain knowledge complexity.....	27

4.2.2 Strategies in acquiring domain knowledge	29
4.2.3 Transferring knowledge	32
4.3 Requirements acquisition	33
4.3.1 Stakeholder engagement	33
4.3.2 Approaches to acquiring requirements.....	35
4.3.3 Recognising constraints in requirements acquisition	38
4.4 Communication of requirements	39
4.4.1 Approaches to communicating requirements	39
4.4.2 Recognising constraints in requirements communication	42
4.5 Business domain knowledge vs soft skills.....	43
4.5.1 Role of domain knowledge of business analysts.....	43
4.5.2 Role of soft skills of business analysts.....	45
4.6 Chapter conclusion	47
Chapter 5 Discussion	49
5.1 Introduction	49
5.2 Business domain knowledge	49
5.3 Requirements acquisition	50
5.4 Communication of requirements	51
5.5 Business domain knowledge vs soft skills.....	51
5.6 Chapter conclusion	51
Chapter 6 Conclusion.....	53
6.1 Theoretical contribution and practical implications of study	53
6.2 Limitations of the study and opportunities for future research.....	54
References.....	55
Appendix A: Invitation letter sent to potential participants (LinkedIn connections).....	60
Appendix B: Interview guide.....	61
Appendix C: Ethics approval	62
Appendix D: Participant Information Sheet.....	63
Appendix E: Consent Form	66
Appendix F: Generation of codes from selected participant quotes by participant	67

List of Figures

Figure 1.1: ISD team members.....	1
Figure 2.1: Stages of Waterfall model.....	7
Figure 2.2: Spiral model (showing a single spiral).....	8
Figure 2.3: Knowledge flow in ISD process.....	10
Figure 2.4: Phases of knowledge management process in ISD.....	11
Figure 3.1: Construction from codes to sub-theme and theme.....	22
Figure 3.2: Construction of themes from sub-themes.....	23
Figure 4.1: Construction of domain knowledge complexity sub-theme.....	29
Figure 4.2: Construction of strategies in acquiring domain knowledge sub-theme.....	32
Figure 4.3: Construction of transferring knowledge sub-theme.....	33
Figure 4.4: Construction of stakeholder engagement sub-theme.....	37
Figure 4.6: Construction of recognising constraints in requirement acquisition sub-theme.....	39
Figure 4.7: Construction of approaches in communicating requirements sub-theme.....	41
Figure 4.8: Construction of recognising constraints in requirements communication sub-theme.....	43
Figure 4.9: Construction of role of domain knowledge of business analyst sub-theme.....	45
Figure 4.10: Construction of role of soft skills of business analyst sub-theme.....	47

List of Tables

Table 3.1: Interview Details and Participants' Experience.....	18
Table 3.2: Examples of Codes Generated from Interview Transcript of Participant RY.....	21
Table 4.1: Construction of Sub-themes and Themes from Codes.....	26

Attestation of Authorship

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgements), nor material of which a substantial extent has been submitted for the award of any other degree or diploma of a university or other institute of higher learning.

Signed:

27 January 2021

Acknowledgements

At the outset, I would like to express my sincere gratitude to my research supervisor Dr Maduka Subasinghage, Lecturer (Business Information Systems department) who not only helped me in choosing the research topic but provided continued support and guidance throughout my research with patience, and her academic ability and research experience.

My foremost gratitude goes to my co-supervisor, Dr Antonio Diaz Andrade, Professor (Business Information Systems department) whose warm encouragement, sharp mind, academic excellence, and research expertise gave me a deeper understanding of my research and immensely helped me to complete my research with a calmness which I never thought was possible.

My gratitude goes to every participant of my research, firstly for agreeing to participate in the research, and then sharing their experiences, and perceptions with, I can say, much frankness. I hope the participants liked the interview process as much as I enjoyed my conversations with each one of them. I learnt a lot from the journey and career of the business analysts and of course, the learning from my supervisors was much more.

I would like to thank my father who has been the pillar of support providing continuous encouragement throughout the research, a main reason that I was able to complete my dissertation. On a more emotional note, my special acknowledgement goes to my late mother who continues to, till date, inspire me to work diligently.

Ethics approval for this research was obtained from Auckland University of Technology Ethics Committee on 2 September 2020 (reference number 20/217).

Chapter 1 Introduction

1.1 Background

Information systems development (ISD) projects consist of team members such as business analysts, project managers, system architect, system analyst, software developers and software testers. Business analysts equipped with domain knowledge play a central role among the ISD team members, though the primary responsibility for timely and successful completion of projects rests with the project manager. The system architect is responsible for constructing the overall solution, inspecting both hardware and software requirements. The system analyst does analysis of both existing and proposed systems to ensure that the proposed system fulfils client's requirements. The software developer (programmer) is responsible for coding and development of the system. The software tester is responsible for testing the system functions as per the set out requirements and also documentation (Friedrich & Poll, 2007). The composition of a typical ISD team depicting the business analyst's central role interacting with team members is given in Figure 1.1.

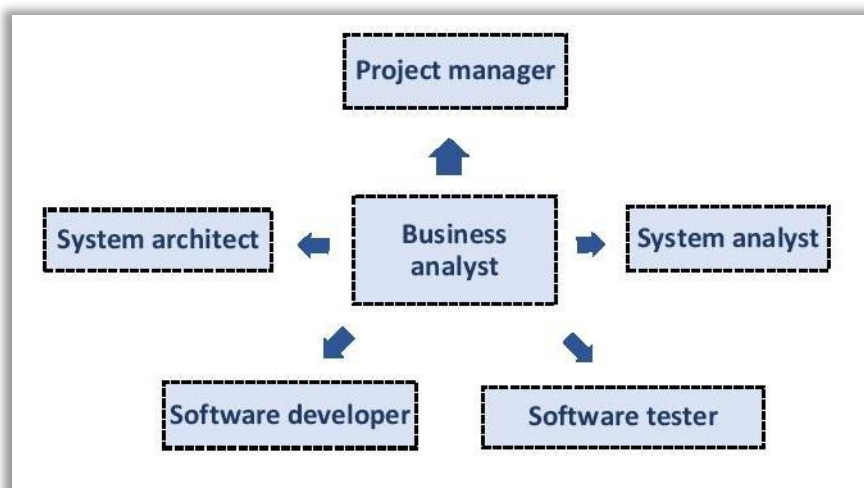


Figure 1.1: ISD team members

This research focuses on business analysts, specifically the importance of domain knowledge. Business analysts' domain knowledge is crucial in information systems projects (Buchan et al., 2009). Business domain knowledge refers to knowledge of the client's business objectives, rules, work routines, processes, practices, and stakeholder needs for ISD (Tiwana, 2003, 2012). The domain knowledge helps business analysts fulfil their responsibilities which include evaluation of business needs, contribution to the design and development of the business solution; and working closely with developers and end users to ensure technical compatibility and user satisfaction (Richards & Marrone, 2014). Business analysts accomplish their responsibilities mainly through acquisition of client requirements and

communication of the requirements in a clear and comprehensive manner to the development teams (Buchan et al., 2009).

The aim of my research is to find out how might the business domain knowledge of business analysts impact acquisition of client requirements and communication of client requirements to multiple team members in ISD projects.

1.2 Research problem and rationale

During my five years of work experience as a business analyst, I had realised, to some extent, the importance of business domain knowledge in acquisition of client requirements and communication of requirements prescriptions. However, my experience remained restricted to ISD projects in human resources functional domain and I did not familiarise myself with any other business domain. Also, I came to know from other business analysts that almost every analyst had certain difficulties in acquiring sufficient knowledge in initial months of handling projects, especially in some domains such as finance, insurance, and health care. The conversations have stimulated my interest in knowing the role of domain knowledge of business analysts in acquisition and communication of client requirements.

The extant literature shows that business analyst's domain knowledge improves the acquisition and communication of client requirements (Buchan et al., 2009; Hadar et al., 2012). However, the issues of how business analysts' domain knowledge impacts acquisition and communication of requirements and how business analysts strengthened their domain knowledge have not received much attention in the existing literature. Therefore, I decided to conduct this research to better understand the role of business domain knowledge of business analysts in requirements acquisition and communication of client requirements in ISD projects.

1.3 Research questions and objectives

This study addresses the following research questions:

1. How does business domain knowledge of business analysts impact acquisition of client requirements?
2. How does business domain knowledge of business analysts impact communication of client requirements to multiple team members in ISD projects?

The main objectives underpinning the research questions are exploration of **how the business analysts' business domain knowledge influence acquisition of client requirements and communication with team members.**

1.4 Methodology

The literature review provides the theoretical foundation for my research on the role of business domain knowledge of business analysts in the acquisition and communication of client requirements in ISD

projects. The purpose of my research and the research questions guided me in selection of the methodology to explore the research topic (Wahyuni, 2012). Ontologically, my research takes a nominalist position which is that “no objective knowledge is possible because the findings are based on the research participants’ subjective interpretations of experiences” (Neuman, 2014). Epistemologically, it is an interpretivist paradigm recognising that people with their varied backgrounds and experiences construct reality through social interactions (Neuman, 2014). I have chosen the qualitative design for my research because it helps in understanding the participants with different experiences and in deriving insights from the responses to ‘how’ and ‘why’ questions (Yin, 2016). Accordingly, I conducted interviews with business analysts to understand their experiences and the subjective meanings they attached to it. I used thematic analysis for analysing the interview participants responses.

1.5 Outline of the dissertation

This dissertation has six chapters. Chapter one introduces the background of the research topic and rationale and reasons for choosing this research topic. The research questions, as well as the objectives underpinning the questions, are also described. A brief outline of the methodology followed in this research is also delineated.

Chapter two critically reviews the literature on my research topic to describe the phases of ISD process, dimensions of business domain knowledge and the knowledge management process in ISD organisations.

Chapter three describes the research methodology, data collection method and the thematic analysis used in this research.

Chapter four on findings presents in detail the codes, themes and sub-themes derived from thematic analysis of participants’ responses.

Chapter five discusses the significance of the research findings by juxtaposing them with interconnected portions of the literature review for a clearer understanding of what the findings offer as answers to my research questions. The chapter concludes with implications of the research findings for implementation.

Chapter six on ‘conclusion’ brings out the salient learnings from my research, implications for practice, and strengths and limitations of the research and indicates areas for future research in related topics.

Chapter 2 Literature review

2.1 Introduction

It is widely accepted that business domain knowledge is crucial for business analysts to acquire client requirements and transforming those requirements into an accurate set of requirements prescriptions (Buchan et al., 2009). The business analysts' domain knowledge contributes significantly to requirements acquisition and analysis and as a result to the overall ISD success (Hadar et al., 2012). The analysts' domain knowledge further facilitates them to improve their communication of requirements prescriptions to internal software teams and client stakeholders for a shared understanding of the problem domain (Buchan et al., 2009). It is fair to say that business analysts' business domain knowledge is the foundation on which the knowledge management process (acquisition and communication of client requirements) flows towards ISD.

My research focuses on finding out how business analysts' business domain knowledge could pave the way towards success in ISD projects. The research sets out to find out the perceptions based on experience, and perspectives of business analysts regarding how business domain knowledge (or lack of) impacts efficiency and effectiveness in requirements acquisition, and communication of requirements prescriptions.

The purpose of this literature review is to provide the theoretical foundation for my research on the role of business analysts' business domain knowledge in the acquisition and communication of client requirements in the ISD process. Accordingly, section 2.2 of the literature review gives a description of the phases of the ISD process, followed by section 2.3 which deals with dimensions of business knowledge, and section 2.4 which dives deep into the operational role of business analysts in the knowledge management process in ISD.

2.2 Information Systems Development process

The ISD process progresses through three phases: (a) domain engineering, (b) requirements engineering, and (c) software design (Bjørner, 2006).

2.2.1 Domain engineering

Domain engineering, the first phase of ISD process, involves engineering (development) of domain descriptions. Domain descriptions, per se, are descriptions of the domain's phenomena, i.e., entities, functions, events, and behaviours. The definitions of domain phenomena with examples from the harbour domain (Bjørner, 2006) are given below.

Entities are things that become data, i.e., having types and values, e.g., ships, holding areas, buoys, quays, and cargo storage areas. *Functions* are actions which yield the data values for entities, e.g., (i) inquiry for whether a ship can be received by the harbour or not; (ii) if the ship can be received, request made for allocation of holding area, buoy, or quay; and (iii) if the ship is allocated a quay, how many containers to unload and how many to load from the harbour. *Events* are things that either trigger actions or are triggered by actions, e.g., (i) a ship arriving at harbour; (ii) the ship declaring itself ready to unload or load; (iii) ship and quay engaging in unloading/loading; and (iv) ship declaring readiness to depart. *Behaviours* are sequences of phenomena performing functions and generating events, e.g., (i) quay behaviour: series of loading/unloading of different ships; and (ii) ship behaviour: series of loading/unloading events at different quays. The domain phenomena are thus expressions of business processes, practices and work routines, the core elements of business domain knowledge (Tiwana, 2003, 2012) which is central to my research.

Business analysts can acquire business domain knowledge through system documents, training sessions, from other team members or group meetings (Bharadwaj & Saxena, 2005). Business analysts who are well conversant with domain descriptions (entities, functions, events and behaviours) can perform requirements engineering more effectively.

2.2.2 Requirements engineering

Requirements engineering is the phase in which business analysts elicit client requirements and develop them into agreed, documented, and specified requirements that they can serve as the basis for all other ISD activities (Pohl, 2010). The role of business analysts is most crucial in the requirements engineering phase. The phase comprises (a) requirements acquisition and sharing, i.e., exploration of stakeholders' needs, and the possible technical solutions, (b) iterations to reshape the shared understanding between stakeholders, and (c) interactions between designers, business analysts, and stakeholders who know system requirements (Damian, 2007).

In the requirements engineering phase, requirements acquisition, and analysis is followed by business analysts writing down the requirements as a formal requirements prescriptions document (Byrd et al., 1992). The document prescribes the desired software properties, i.e., what entities the software must maintain and what functions and behaviours it shall offer (Bjørner, 2006). The importance of the requirement engineering phase may be appreciated by the observation that more than 40% of errors discovered in ISD projects are due to inadequate implementation of this phase, and that it costs ten times more to correct errors made in this phase than errors committed in other phases (Ahsan et al., 2014). After completion of requirements engineering phase in which business analysts need to prepare and provide precise and comprehensive requirements prescriptions to help designers develop high-quality software, the ISD process rolls on to its final phase in which developers take over their responsibility of software design.

2.2.3 Software design

In the software design phase, requirements prescriptions are turned into executable codes in the software. The aim in this phase is to develop software of high-quality - high levels of reliability, usability, efficiency, maintainability, and portability - to achieve the system's goals and purposes (Losavio et al., 2003). Reliability is the ability of a software program to continue to perform its intended role over a period of time to pre-defined conditions. Usability is the extent to which the program can be used by specified users to achieve specified goals with effectiveness and satisfaction. Efficiency involves efficient use of computing resources (e.g., memory, time, and external storage) and codes for the program to fulfil its function. Maintainability refers to how easily and inexpensively the maintenance tasks can be performed, i.e., locating and fixing any defect in the operational program. Portability is the ease with which a program can be transferred from one hardware and/or software environment to another (Fitzpatrick, 1996). The software design phase also results in the production of validation and verification documents and supporting documents, i.e., training manuals, installation manuals, user manuals, maintenance manuals and development and maintenance logbooks.

It is appreciated that the main responsibilities of the business analyst are during the first two phases of ISD process, i.e., domain engineering and requirements engineering, while the development team comes into action in the third phase (software design). I have adopted Bjørner's (2006) three ISD phases because they form the basis of many software development life cycles (SDLCs) such as waterfall, spiral, and joint application development (JAD) (Ruparelia, 2010). For example, the waterfall model uses Bjørner's requirements engineering and software design phases, albeit by dividing the phases into five sequential and non-overlapping stages, i.e., (1) requirements (acquisition, analysis, and documentation); (2) high-level design including planning for the solution, and architecture design; (3) coding; (4) testing and checking of developed software to find out bugs and system glitches, if any, and fixing them; and (5) maintenance of software after release (Alshamrani et al., 2015). Business analyst has the central role in waterfall model's first stage, i.e., requirements, and also a coordinating role in the second stage (high-level design). The model's stages (Alshamrani et al., 2015; Balaji & Murugayian, 2012), flowing down like a waterfall are constructed in Figure 2.1.

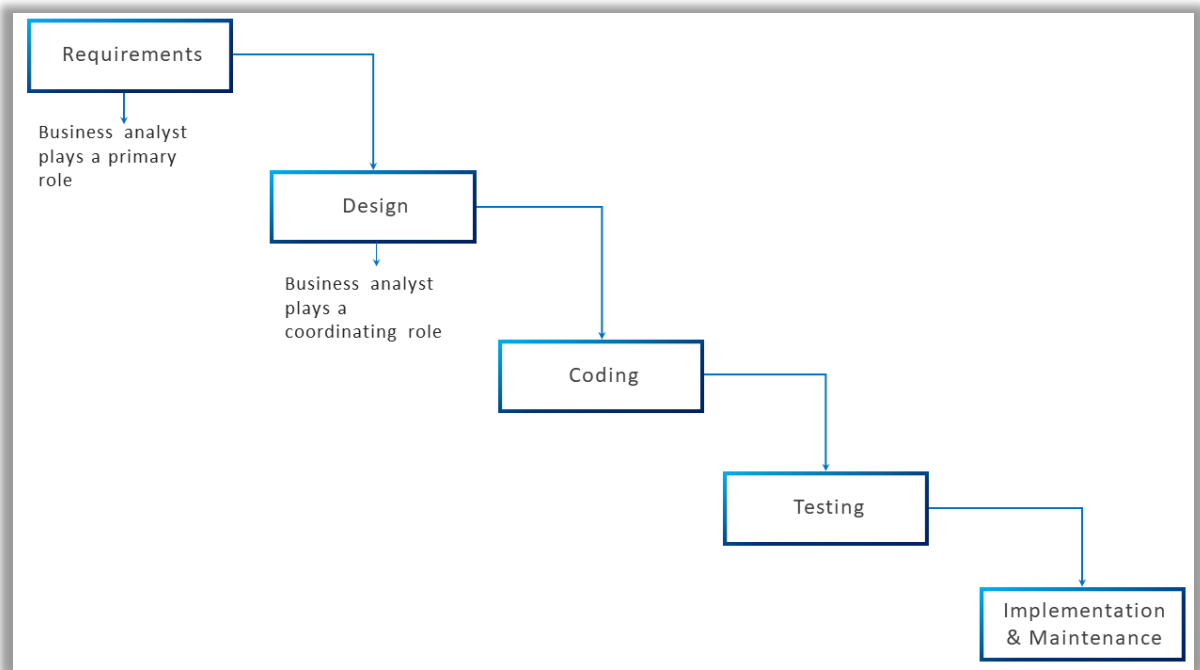


Figure 2.1: Stages of waterfall model (adapted from Balaji & Murugayian, 2012)

The spiral model (Alshamrani et al., 2015; Ruparelia, 2010) is a modified waterfall model with several iterations spiraling out. Each spiral goes through four quadrants, (1) planning to determine system requirements through communications between clients and business analysts; (2) identification and resolution of risks and production of prototypes; (3) software development and testing; and (4) project evaluation (review) by clients before the next iteration. The reviews ensure that clients are committed to the approach to be taken during the next cycle which helps in managing the risks and control the costs. The business analyst has the central role in spiral model's first stage, i.e., planning, a coordinating role in the second stage, i.e. risk analysis and a primary role in feedback in the evaluation stage (Alshamrani et al., 2015; Ruparelia, 2010). The spiral model (showing a single spiral to ensure clarity) is given in Figure 2.2.

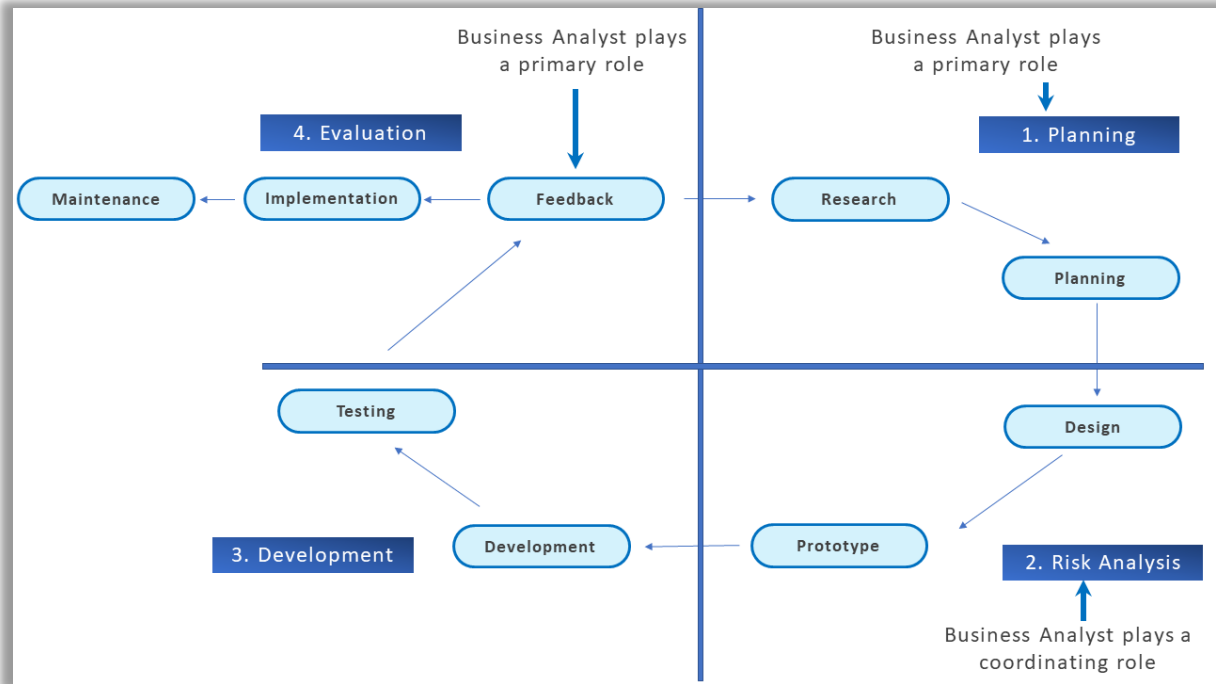


Figure 2.2: Spiral model showing a single model (adapted from Alshamrani et al., 2015 and Ruparelia, 2010)

In JAD (Friedrich & Poll, 2007), the ISD team members (with the business analyst playing a crucial role) and clients (including users) come together in a workshop-mode to interact, brainstorm, and discuss different solutions. The project owner's feedback is received at every JAD workshop and also after the prototype is completed. Workshops are held throughout the project's duration which enable developers to raise queries or issues even at later stages of software development. The involvement of users in JAD workshops helps to increase chances of the ISD success (Friedrich & Poll, 2007).

Business analysts play a key role at specific stages of different software development models such as waterfall, spiral, and JAD. It is also inferred that business domain knowledge of business analysts is crucial for them to effectively contribute to the ISD process. The literature on dimensions of business domain knowledge is reviewed next, along with the role of business analysts in the knowledge management process in ISD organisations.

2.3 Business domain knowledge

Business domain knowledge refers to knowledge of the client's business objectives, rules, work routines, processes, practices, and stakeholder needs for ISD (Tiwana, 2003, 2012). For example, domain knowledge in manufacturing companies includes knowledge of bill-of-materials, capacity, safety stock, manufacturing lead-time and how they align with the production plans (Kang et al., 2017); and in agriculture, domain knowledge includes knowledge on crops, pests, diseases, land preparation, growing and harvesting methods (Drury et al., 2019). Within the broader business domain knowledge,

application domain knowledge refers to knowledge of the specific problem area to be addressed by the software program (Bjørner, 2006; Khatri & Vessey, 2016). Application domain knowledge influences the understanding of requirements of any new software features, as well as their implementation (Shaft & Vessey, 1998). Further, the synthesis of technical knowledge with application domain knowledge could enhance software design effectiveness, increase development efficiency, and reduce defects (Tiwana, 2003). The literature on dimensions of knowledge is reviewed first so that it becomes easier to understand the business analysts' role in the knowledge management process in ISD organisations.

2.3.1 Dimensions of knowledge

The various dimensions of knowledge are systemic, strategic, epistemological, and ontological. The systemic dimension of knowledge considers data as the input, information as the process and knowledge as the output. In the strategic dimension, various resources and capabilities (expert knowledge and vision) are seen to strategically contribute to the economic success of organisations (Campos & Sánchez, 2003). The business analysts' domain knowledge is a strategic resource for ISD, i.e., strategic use of domain knowledge enhances the quality of developed software at a lesser cost (Prokesch, 1997). The top-level management of organisations could also facilitate domain knowledge transfer across the entire ISD staff by including into projects one or two individuals having both application domain and technical knowledge (Walz et al., 1993).

In its epistemological dimension and with a constructionist perspective, knowledge develops across two levels, tacit and explicit (Campos & Sánchez, 2003). The domain knowledge gained by business analysts through experience is often tacit and requires face-to-face interaction for effective sharing with other team members (Bharadwaj & Saxena, 2005). However, the same tacit knowledge, when documented, becomes explicit knowledge and becomes easy to share effectively with other stakeholders, and more importantly, with internal ISD team members (Bharadwaj & Saxena, 2005; Campos & Sánchez, 2003). Despite the shortcomings of tacit knowledge, both tacit and explicit knowledge of business analysts have their respective roles and importance in the ISD process (Jiang et al., 2007).

In its ontological dimension, knowledge is almost always created at the individual level (commonly at business analyst level in ISD) and spread to others for formation of collective knowledge. The collective knowledge is not a simple sum of knowledge emerging from individuals (Fiol & Lyles, 1985) but something greater, significantly contributing to the long-term growth and survival of organisations (Spender, 1996).

Based on the epistemological and ontological dimensions of knowledge, one can see four types of knowledge emerging during the ISD process: embodied & embrained knowledge at individual level; and embedded & encoded knowledge at collective level (Jiang et al., 2007; Lam, 2000; Nidhraa et al., 2013). Embodied knowledge is the business analyst's tacit knowledge which encompasses knowledge,

skills and expertise resulting from experience. Embrained knowledge refers to the analyst's explicit documented knowledge. Embedded knowledge is tacit knowledge at collective (organisational) level, and includes skills, perspectives, and expertise brought in by various stakeholders, e.g., analysts, developers, and end-users. Encoded knowledge refers to explicit knowledge at organisational level, for example, knowledge documented in the repository.

It may be conceptualised that the business analyst reshapes his/her tacit knowledge (embodied knowledge) into the explicit domain descriptions document (embrained knowledge). Subsequently, the business analyst also transforms the acquired client requirements into an explicit requirements prescriptions document. Finally, it is also the analyst's responsibility to feed these domain descriptions and requirements prescriptions - after due validation by relevant stakeholders - into the organisational knowledge repository as explicit, collective knowledge (encoded knowledge) for future reference and use. The tacit knowledge of development team members (embedded knowledge) could also contribute to the organisational repositories as encoded knowledge. The conceptual diagram portraying knowledge flow in the ISD process is given in Figure 2.3.

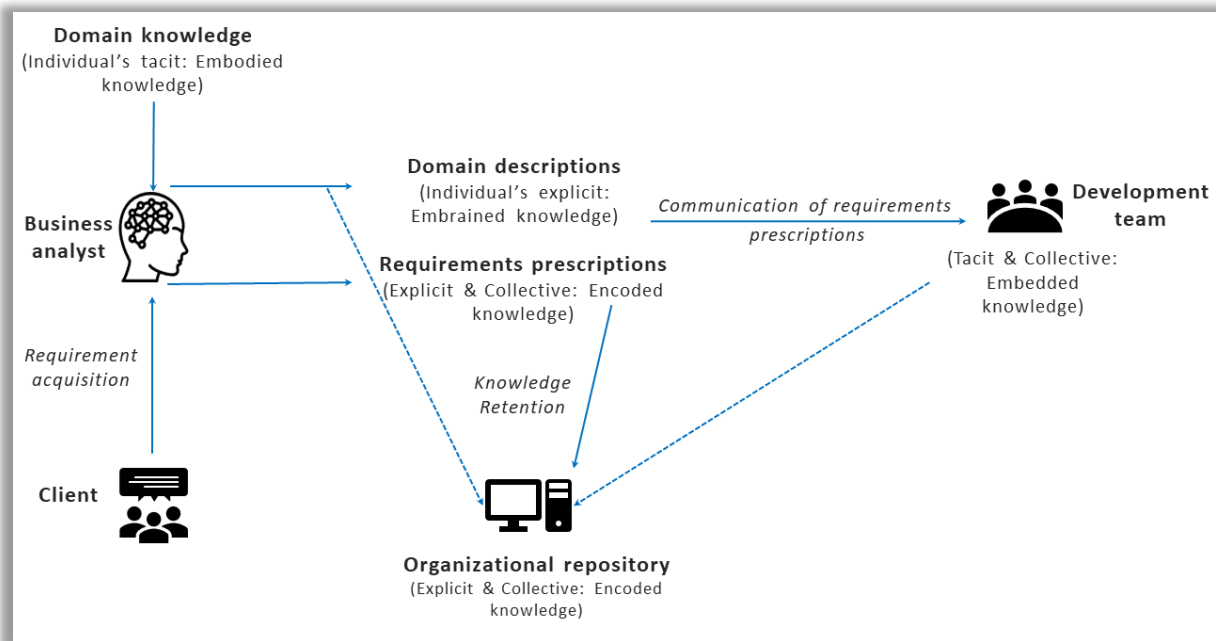


Figure 2.3: Knowledge flow in ISD process

The literature review of knowledge dimensions and flow in ISD process serves as a starting point for the following exposition of the knowledge management process, a crucial process that determines ISD success (Vitharana et al., 2012).

2.4 Knowledge management process

The knowledge management process is described as the creation, sharing, and use of knowledge to enhance learning and performance in organisations (Bharadwaj & Saxena, 2005). It represents

knowledge flow from person(s) who know(s) to person(s) who need(s) to know in the organisation (Hansen et al., 1999). A consensus view of the knowledge management process in ISD organisations is that it comprises four phases: requirements acquisition, communication of requirements prescriptions, software design and knowledge retention (Sedera & Gable, 2010). A diagram illustrating the four phases of knowledge management process in ISD is given in Figure 2.4.

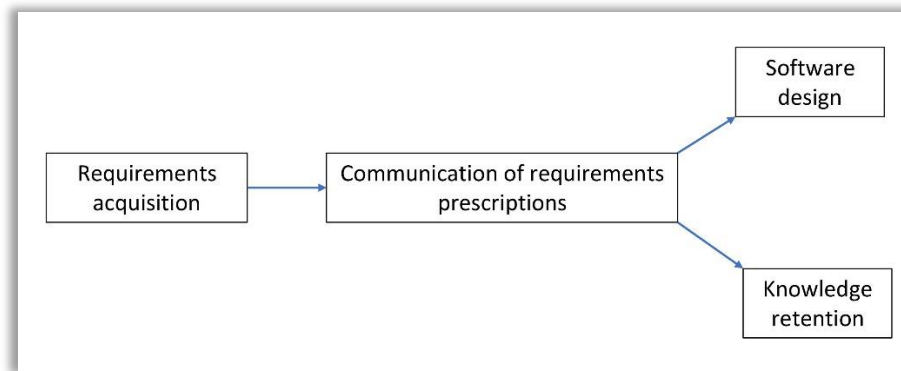


Figure 2.4: Phases of knowledge management process in ISD

The literature review now focuses on the three phases of the knowledge management process for which the business analysts are directly responsible, i.e., requirements acquisition, communication of requirements prescriptions and knowledge retention.

2.4.1 Requirements acquisition phase

Knowledge acquisition in ISD refers to acquisition of client requirements, i.e., attributes, functions, and behaviours needed in the software to accomplish system goals (Carr, 2000). During requirements acquisition, business analysts elicit the requirements through consultation and communication with the stakeholders, using their domain knowledge to advantage (Ganesh & Thangasamy, 2011).

I have adopted Bjørner's (2006) approach for requirements acquisition because this approach which includes both questionnaires and interviews as two different steps is likely to result in more effective acquisition of comprehensive requirements as compared to the approach suggested by (Ahsan et al., 2014) who propound the use of either questionnaires or interviews. The first step in Bjørner's (2006) approach is that business analysts review the available list of stakeholders to see if it is adequate, and if not, include other relevant stakeholders to make it adequate. The next step is to review the available domain documents to see whether they are adequate, and if not, make them adequate by getting additional relevant documents. Thereafter, the analysts are expected to study the documents to see their relevance and utility to the current project. In the next step, the business analysts build rapport with the relevant stakeholders through conversations (personal chats). Subsequently, questionnaires are developed, printed, and distributed to the stakeholders for them to fill as much as they can. After this, the analysts interview the stakeholders and record the proceedings electronically/note down on paper

to develop a document having requirements prescription unit(s). During the interviews, decisions are taken consensually by clients and business analysts to reduce chances of conflicts arising at later stages of the ISD projects. It is important to consensually take decisions, for example, on which domain phenomena are to be included in the requirements, and how they should be manifested (Bjørner, 2006). The consultations also help in sharing of domain knowledge and bring in rich ideas that enhance the quality of requirements acquisition, analysis, and decision-making (Ranganathan & Sethi, 2002). In fact, the quality of the interviews can be assessed by its effectiveness in acquisition of client requirements which in turn would shape the software system quality (Aranda et al., 2012). After the interviews, each prescription unit is examined to affix requirements prescription index unit attributes. Finally, the requirements prescription units are reexamined to see if they are appropriate and adequate, and whether some units should be rejected and if some more are to be added.

Even such a systematic approach taken by business analysts to the requirements acquisition may not be sufficient to develop clear requirements prescriptions unless it is followed by a detailed requirements analysis. The quality of requirements analysis is considered to be as important as requirements acquisition for ISD success (Awal et al., 2018). Business analysts can enhance the quality of requirements analysis and arrive at the best possible solutions, by holding discussions with users and domain experts (Kroha & Labra, 2009). A high-quality requirements analysis helps in improving the decision-making and achievement of the organisational objectives (Byrd et al., 1992).

Business analysts should not only make sense of client requirements and perspectives but also try to integrate them into their own knowledge and judgement, a process known as assimilation (Schenk et al., 1998). During assimilation, the new information that emerges during requirements analysis strengthens the existing business domain knowledge of business analysts (Lefkowitz & Lesser, 1988). Domain-specific experience, besides improving the analyst's domain knowledge, also increases their awareness of domain problems (Schenk et al., 1998). It is expected that the business analyst's knowledge of a particular domain would become stronger with experience of working in multiple projects in the same domain. The business domain knowledge gained during previous projects in the same domain is extremely useful for business analysts to determine requirements more effectively in their current projects (Hadar et al., 2012).

2.4.1.1 Role of business domain knowledge of business analysts in requirements acquisition

Business analysts' business domain knowledge is vital for acquisition of client requirements in a precise, complete, comprehensive and effective manner and in requirements analysis (Vitharana et al., 2012). Rather, business domain knowledge is 'the business analyst's tool' to precisely collect client requirements (Ahsan et al., 2014). The domain knowledge also helps business analysts to understand the client's business before proposing a solution for enhancing client's operations (Friedrich & Poll,

2007). In addition, business domain knowledge helps business analysts to identify problems that need to be addressed and refined, to help developers in ISD (Latef et al., 2018).

Domain knowledge includes familiarity with *domain terminology* (terms specific to a particular domain, e.g., ‘claim payment’ in health care administration) which helps business analysts to fluently ask questions that clients easily understand to give precise answers (Bjørner, 2006). It is essential for business analysts to first learn domain terminology so that they can communicate effectively with the clients during requirements acquisition (Hadar et al., 2012). Use of domain terminology with clients facilitates acquisition of accurate requirements (Bostrom, 1989). Thus, it is concluded that familiarity with domain terminology is an inescapable need for business analysts in acquisition of clear and complete requirements and thus also for ISD success.

Domain knowledge of business analysts helps them to gain trust of their clients. Business analysts who have a better knowledge of the business domain and its regulatory contexts are trusted more by their clients (Fannoun & Kerins, 2019). Trust creates an environment during requirements acquisition in which clients freely discuss requirements in much detail, which helps in the development of better software products. Clients who trust business analysts because of their domain knowledge, allow the analyst to lead the interview proactively and to give ideas for developing an improved product (Hadar et al., 2012). After an understanding of the crucial role of business analysts’ domain knowledge in requirements acquisition, now the review of literature explores the problems faced by business analysts during requirements acquisition, either due to lack of domain knowledge or due to other reasons.

Business analysts’ lack of domain knowledge makes it difficult for them to clearly articulate their thoughts resulting in sub-optimal requirements acquisition (Buchan et al., 2009). Business analysts’ insufficient domain knowledge could also make the requirements acquisition process error-prone, time-consuming, and expensive (Vitharana et al., 2012). Inadequate requirements acquisition by business analysts due to lack of domain knowledge may directly lead to the product not fulfilling client’s needs, and cause ISD failures through software reworks, late delivery, and poor performance (Carr, 2000). More importantly, problems in requirements acquisition due to business analysts’ lack of domain knowledge cannot be rectified by a better requirements analysis, verification, or validation (Drake et al., 1993). ISD organisations should arrange training for their business analysts lacking domain knowledge so that they become better in understanding and acquiring the client requirements (Hadar et al., 2012).

Business analysts face difficulties in gaining knowledge across multiple domains while serving in organisations which service clients from different domains. These organisations could address the issue by acquiring domain knowledge from experts of different domains (e.g., telecom, banking, satellite, insurance, logistics, and healthcare) and other sources and then code it into an ‘expert system’ for reference and use by business analysts (Annaiahshetty & Prasad, 2013).

Seventy five percent of projects' time may be spent on learning only if analysts lack domain knowledge, or when clients are unclear on requirements (Walz et al., 1993). Failure of clients to articulate their requirements properly could be because of lack of clarity in articulating requirements, frequently changing the requirements, requirements not appropriate to adequately solve the business problem and grossly incorrect requirements (Ganesh & Thangasamy, 2011). When clients are unable to use domain terminology or articulate their requirements clearly, business analysts find it difficult to understand the actual requirements (Bennatan, 1995; Buchan et al., 2009). Business analysts find it challenging to elicit requirements properly when the clients present conflicting requirements, i.e., solution to one requirement prevents implementation of the other requirement (Salado & Nilchiani, 2014). The requirements acquisition process also becomes demanding for business analysts when the clients do not share all the relevant information regarding their organisation's priorities, standards, and policies (Damian, 2007).

The thin spread of application domain knowledge among business analysts and clients could hamper the communication between them and result in poor requirements acquisition (Al-Rawas & Easterbrook, 1996; Curtis et al., 1988; Kroha & Labra, 2009). Also, any misunderstanding between the business analysts and clients can cause communication breakdowns resulting in poor requirements acquisition and project failures (Kroha and Labra, 2009). Though the requirements acquisition could be the most difficult and error-prone part of the ISD process, improved communication between business analysts and clients helps business analysts to exactly elicit what the users really need (Drake et al., 1993). Business analysts are required to continue their interactions with clients throughout the development process, particularly if the requirements had not been captured adequately or properly at the initial requirements acquisition phase (Tiwana, 2003). Communication issues between the clients and business analysts are more common in outsourced ISD projects because of difficulties caused by geographic distances involving different time-zones, different cultural concepts and languages, insufficient knowledge transfer and lack of consistent client support (Alami et al., 2014).

Business analysts' poor requirements acquisition is directly responsible for 45% of ISD project failures (Awal et al., 2018). The situation is worse in large-scale projects, where 90% of failures are attributed to inaccurate requirements acquisition (Davey & Parker, 2015). Business analysts need to be careful to avoid errors during requirements acquisition as these errors are extremely expensive to correct when they are detected later during testing or implementation (Drake et al., 1993; Buchan et al., 2009).

After the successful completion of the requirements acquisition and analysis, business analysts are required to communicate the requirements prescriptions in the most comprehensive and clear manner to the internal development team members for their easy understanding of the requirements.

2.4.2 Communication of requirements prescriptions

Business analysts should communicate the requirements prescriptions to the development team members in a precise and comprehensible way to achieve ISD success. Business analysts play an intermediary role in the 'Quality Functions Deployment approach' of ISD which begins with client requirements and ends with developers fulfilling the requirements (Meher & Mishra, 2019). Further, the knowledge shared by business analysts with their team members leads to organisational learning that acts as the mediator for project success (Jiang et al., 2007).

When business analysts do not communicate knowledge effectively, coordination breakdowns occur causing lowered developer productivity and increased software defects (Damian, 2007). This communication issue could be addressed in organisations through a robust knowledge transfer strategy (Desouza et al., 2006). The knowledge transfer strategy involves the top-level management making efforts to disseminate domain knowledge (both IT-related and business-related knowledge) by a formal process, for example, by establishment of task groups (Ranganathan & Sethi, 2002). In addition, business analysts could improve their communication by using relatively novel methods such as use of sketched information of users, activities, devices, and the context of future applications (Mollá et al., 2018). The responsibilities of business analysts do not end with communication of requirements to the developers, as they should contribute to retention of knowledge gained during the ISD process in an organisational repository for reference and use in future projects.

Retention of knowledge gained during ISD in an organisational repository serves as a useful resource for business analysts in future requirements acquisitions, particularly for preparing the appropriate questions for interviews with clients (Vitharana et al., 2012). When knowledge is stored in organisational repositories, it helps business analysts to access knowledge in future and also for knowledge transfer across projects (Desouza et al., 2006). Business analysts could store in repositories the lessons learnt, mistakes developers should not repeat, tips and techniques for accomplishing specific tasks, and methods that had proved successful (Bharadwaj & Saxena, 2005). It is important that organisations facilitate knowledge retention because business analysts leaving the organisations may take away their tacit knowledge along with them (Ramona & Alexandra, 2019; Ryan & O'Connor, 2013). Knowledge repositories are especially useful in organisations using agile methodology, in which the focus is more on developing codes and less on documentation, and the created knowledge could go away with analysts who leave the organisation (Ganesh & Thangasamy, 2011). However, most organisations may not have a system in place for business analysts to store and use relevant knowledge gathered from past engagements in a timely and concerted manner (Desouza et al., 2006). One way organisations can facilitate knowledge retention is by rewarding business analysts who feed in high-value knowledge into the repositories (Desouza et al., 2006).

2.5 Conceptual foundation for my research

The literature review provides me the theoretical foundation for my research on the role of business domain knowledge of business analysts in the acquisition and communication of client requirements in ISD. The review makes it amply clear in the beginning itself that business analysts should be well conversant with the domain descriptions for successful requirements acquisition and communication of requirements. It is also seen that business analysts can improve their domain knowledge by their own efforts as well as with organisational support, if available. My research aims at finding out from the participants as to how might the role of domain knowledge impact the acquisition and communication of requirements in ISD projects. I could also foresee that the participants' experience while working in new domains could enrich my knowledge and understanding of the role of business domain knowledge in ISD success.

I knew through the literature review that my research participants may narrate a variety of perceptions based on their experiences, on how their business domain knowledge (or the lack of it) impacted acquisition of requirements and communication of requirements. In addition, the literature review makes me interested in knowing the efforts made by the participants to establish rapport and gain trust of their clients. I expect that my research would bring out the participants' experiences on if, how and why their consultation efforts and skills were tested during the requirements acquisition phase.

The literature review also throws light on the challenges business analysts could face in effectively communicating the requirements prescriptions to the development team members. I should be able to find out through my research whether the participants' perceptions are comparable or entirely different from what has been published in literature in this regard.

The literature review has helped me in developing the interview guide in such a manner that I can get responses from the participants that would help me get answers to my research questions. I expect this research to improve my understanding of domain knowledge management by analysing experiences and learnings of the participants. Based on the findings that emerge from my research, I may also be in a position to suggest some steps that could contribute, even if partially, for resolution of some issues related to domain knowledge of business analysts.

Chapter 3 Methodology

3.1 Introduction

This chapter discusses the research paradigm, methodology and ethical considerations of my research. Section 3.2 of this chapter describes the research paradigm and the philosophical assumptions that guided my research. Section 3.3 goes into the details of the research methodology, starting with sampling, recruitment, and background information of the participants, and then describing the data collection method used and how the collected data were analysed thematically. The chapter concludes with section 3.4 which deals with ethical considerations of the research.

3.2 Research paradigm

On the basis of ontological assumptions of reality, my research takes a nominalist position that no objective knowledge is possible because the findings are based on the research participants' and my subjective interpretations of experiences (Neuman, 2014). Epistemologically, the research follows the interpretivist paradigm recognising that people with their varied backgrounds and experiences construct reality through social interactions (Neuman, 2014). The interpretive paradigm allowed me to view the business analyst's world 'through the perceptions and experiences of the participants' (Thanh & Thanh, 2015). The research involved interviews with business analysts to understand their experiences and subjective meanings they attached to it.

3.3 Research methodology

I have chosen the qualitative research design for my research, because qualitative research is well suited to obtain textual data on the participants' experiences, and even the social and historical contexts of such experiences (Suter, 2012). The perspective of my research is constructivist as there is a social construction of actual experiences of business analysts. I have primarily adopted a humanistic approach in which the participants can share their life events and feelings (Avgousti, 2013).

3.3.1 Sampling and recruitment

I have considered for inclusion in my research, business analysts involved in acquiring client requirements and communicating the requirements to other team members in ISD projects. The inclusion criterion for my research is that the business analysts have at least six months experience, because in my previous association with many business analysts, everyone had said that one to three months was adequate to gather sufficient domain knowledge, even in domains considered complex by them. The invitations were sent to 18 business analysts who are part of my LinkedIn network and meet the inclusion criterion to participate in the study, of which ten business analysts agreed to participate. The invitation letter sample used is attached as appendix A.

My literature review helped me gather ideas about what should be the main questions and follow-up questions that should be included in the interview. I prepared the interview guide (appendix B) based on these ideas and submitted the guide along with the application form for ethics approval to the Auckland University of Technology Ethics Committee. On receipt of the ethics approval letter (copy of the letter No. 20/217 dated 2 September 2020 is attached as appendix C), emails were sent to the potential participants. As part of the recruitment process a detailed participant information sheet (attached as appendix D) and consent form (attached as appendix E) was shared with potential participants who showed their willingness to participate.

3.3.2 Interview details and background information of participants

The dates and duration of each interview, whether the interview was conducted face-to-face or virtually, and the participants' business analyst experience in different domains is presented in table 3.1.

Table 3.1: Interview details and participants' experience

Participant (pseudonym)	Date of interview	Interview duration	Face-to-face/ virtual interview	Business analyst experience (in years)	Experience in individual domain
AX	12/09/2020	35 minutes	Face-to-face	10	Infrastructure: 1 year Banking and financial services: 9 years
CX	15/09/2020	40 minutes	Face-to-face	4	Healthcare: 4 years
DX	17/09/2020	1 hour 15 minutes	Face-to-face	20	Insurance: 20 years
EX	07/09/2020	30 minutes	Face-to-face	1	Information Technology: 1 year
IX	08/09/2020	1 hour	Virtual	7	Insurance: 7 years
KX	27/09/2020	1 hour	Face-to-face	10	Insurance: 5 years Banking: 3 years Retail: 2 years
KY	08/10/2020	1 hour	Face-to-face	6	IT human resources systems: 6 years
NX	10/09/2020	1 hour	Face-to-face	4	Logistics: 6 months Banking: 6 months Procurement: 1 year Education: 1 year Infrastructure: 6 months Retail: 6 months
RX	07/09/2020	1 hour	Virtual	8	Stock market: 1 year Taxation: 6 months; Banking: 1 year; Telecom: 3 years 6 months; Insurance: 2 years
RY	13/09/2020	45 minutes	Virtual	13	Financial accounting: 4 years; Cargo: 2 years; Airlines: 5 years; Banking: 2 years

The interviews were conducted during the period 7 September 2020 to 10 October 2020. Individual interviews lasted between 30 and 75 minutes. The seven face-to-face interviews were conducted in quiet public cafés or parks in Auckland. The other three interviews were conducted virtually based on the participants' convenience. The business analyst experience of the participants varied from one to twenty years. The participants' areas of business analyst experience varied from one to six domains.

3.3.3 Data collection: Semi-structured interviews

I chose semi-structured interviews for data collection which enabled me to elicit rich information of participants' experiences and perceptions on role of business domain knowledge in ISD. The semi structured interviews also provided me flexibility to explore the relevant and related topics that were not included in the interview guide. In addition, the semi-structured interviews facilitated the participants to relate the questions to their experience and provide in-depth information related to the research topic (Bakewell, 2003).

I started the interviews by briefing the participants about the purpose of the research and reiterating confidentiality, anonymity, and voluntary nature of the research. The interview was conducted using the open-ended and follow-up questions in the interview guide. Some probing questions were also asked during the interviews to keep the discussion flowing as well as to get more details on some points that emerged during the interviews. During the interviews, the participants were asked to describe in detail the process through which they acquired client requirements and communicated the requirement prescriptions to developers and other stakeholders. I asked them also about issues they faced in the ISD process due to their insufficient business domain knowledge, if any, and how they tried to improve their domain knowledge. I had taken some written notes during and soon after each interview to record additional information which were considered to be important for the data analysis. After each interview, a debriefing was done during which the participants were also given the opportunity to ask questions, make comments or add any information that was not discussed during the interview. I did all the transcriptions myself, which required repeated listening to many portions of the audio recordings.

3.3.4 Data analysis method: thematic analysis

I chose thematic analysis method to analyse the data collected from the participants as this method is appropriate for examining ways in which participants made meaning out of their experience (Evans, 2017). The analysis involved a deductive approach as the experiences shared by participants were thematically framed and analysed through my pre-existing theoretical understanding of key concepts (Clarke et al., 2006). The key concepts were that business analysts' business domain knowledge is crucial to acquire client requirements and transforming those requirements into an accurate set of requirements prescriptions. Also, business domain knowledge helps business analysts to improve their

communication of requirements prescriptions to internal software teams and client stakeholders for a shared understanding of the problem domain, and thus to ISD success.

The analysis was iterative, i.e., I repeatedly moved back and forth between raw data (participants' narratives), codes, and themes till plausible explanations emerged (Suter, 2012). The analysis followed an idiographic approach (Neuman, 2014), i.e., describing and studying detailed accounts of experiences and perceptions of business analysts. The data analysis uncovered themes, patterns, concepts, and insights (Suter, 2012), which figuratively speaking, allowed the data to "speak for themselves" during the analysis. I could reach conclusions based on the identified patterns and conceptual relationships (not based on statistical relationships, as in quantitative research) (Suter, 2012).

The thematic analysis was conducted in six phases. In phase one, I familiarised myself with the information elicited (dataset) from interviewees by reading the transcripts many times. The repeated readings helped me to clearly understand what the participants meant exactly. I started the analysis of transcriptions only after all ten interviews were completed and transcribed, to ensure that the themes that might come to my mind during the earlier interviews did not influence later interviews.

In phase two, I produced the codes from the interview transcriptions with a deductive approach where existing theoretical concepts informed the coding and analysis. The theoretical concepts helped me make more meaning out of the data. I created Microsoft Word files for each participant with tables having two columns. The interview transcriptions were copied to the left column from which, portion by portion, transcriptions related to a particular idea were recorded as codes in the right side. In this process, every effort was made to use sentences mirroring the participant's language and ideas but leaving out the crutch words like 'you know', 'like', 'so', and 'um'. I generated 55 codes inclusive of every word, phrase or quote that was potentially relevant to my research questions. Table 3.2 shows example of the codes generated for participant RY.

Table 3.2: Examples of codes generated from an interview transcript of participant RY

Interview transcript excerpts	Codes
The current organisation that I am working with supports learning. I have also enrolled to LinkedIn learning, that is one big platform touching every domain.	Training via LinkedIn
When I went for requirement gathering, I was not the expert, I had to ask some open questions like what this is, what are the requirements, and why those kinds of things.	Conducting interviews
The challenge of domain knowledge is in complex domains, for example, network infrastructure is a complex domain.	Complexity in domain
In the initial requirement gathering, I hadn't any clue about what they were talking about because it was very technical, and networking, it is a big sea and there is a lot to learn in the initial stages. You need to understand what they (stakeholders) are talking about. They will constantly use terms you should be aware of, and for that you need to upskill yourself.	Upskilling
First thing before requirements acquisition, I would say, understand the stakeholders, their behaviour, what is their role and way of working.	Understanding the client
Microsoft Teams is really good collaborative tool where you can just add in the details and easy to share in a collaborative way. There are Jira, Microsoft suites, Visio type of tools are mainly used for communicating the requirements.	Using tools

The generation of codes from the participants' selected quotes by each participant is attached as appendix F.

In phase three, I generated sub-themes and themes from the codes. I arranged the themes and sub-themes in such a way that they give a clear narrative about the gathered dataset.

Figure 3.1 shows example of the codes generating into sub-theme 'approaches to requirements acquisition' and theme 'requirement acquisition.'

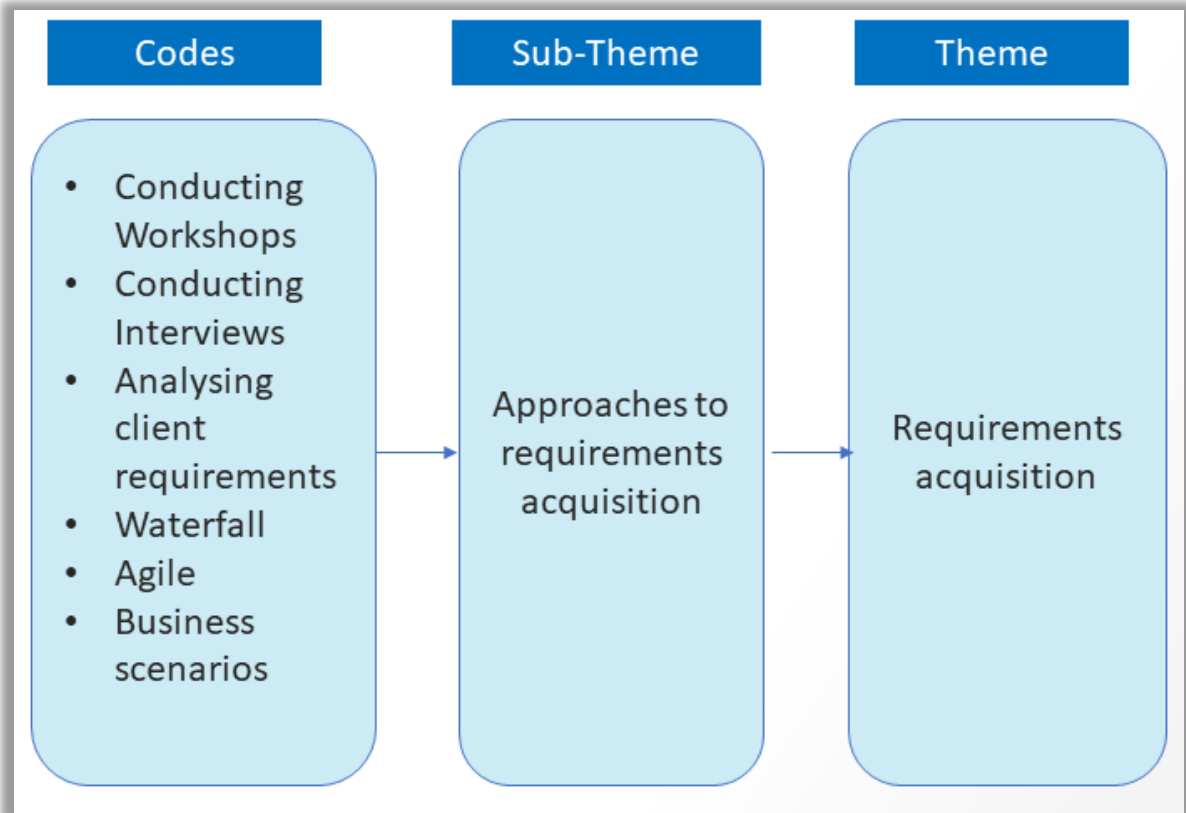


Figure 3.1: Codes generating into sub-theme and theme

In phase four, I reviewed each theme in the context of the dataset and the codes and modified the themes as required. In other words, the themes were re-examined to ensure that there was a clear linkage between the dataset, themes, and research questions. I conducted the analysis, first by distilling the dataset from the transcriptions to derive the codes, condense the codes to form sub-themes and finally to crystallise sub-themes into main themes. However, this was not such a straightforward and linear process, but was recursive, involving repeated visits to the earlier stages to re-examine whether the flow is like a story of data developing to codes, and then to sub-themes, and themes. I had to question myself repeatedly on the rationality of evolution of the themes. These reiterations were done to reassure myself that the data have been utilised appropriately, without missing any relevant data available in the transcriptions.

In phase five, I reworked on the themes addressing my research questions. While exploring the themes, I again asked myself about all data I found as relevant, as to “why is it relevant” and “so what”. The construction of themes from the sub-themes is shown in Figure 3.2.

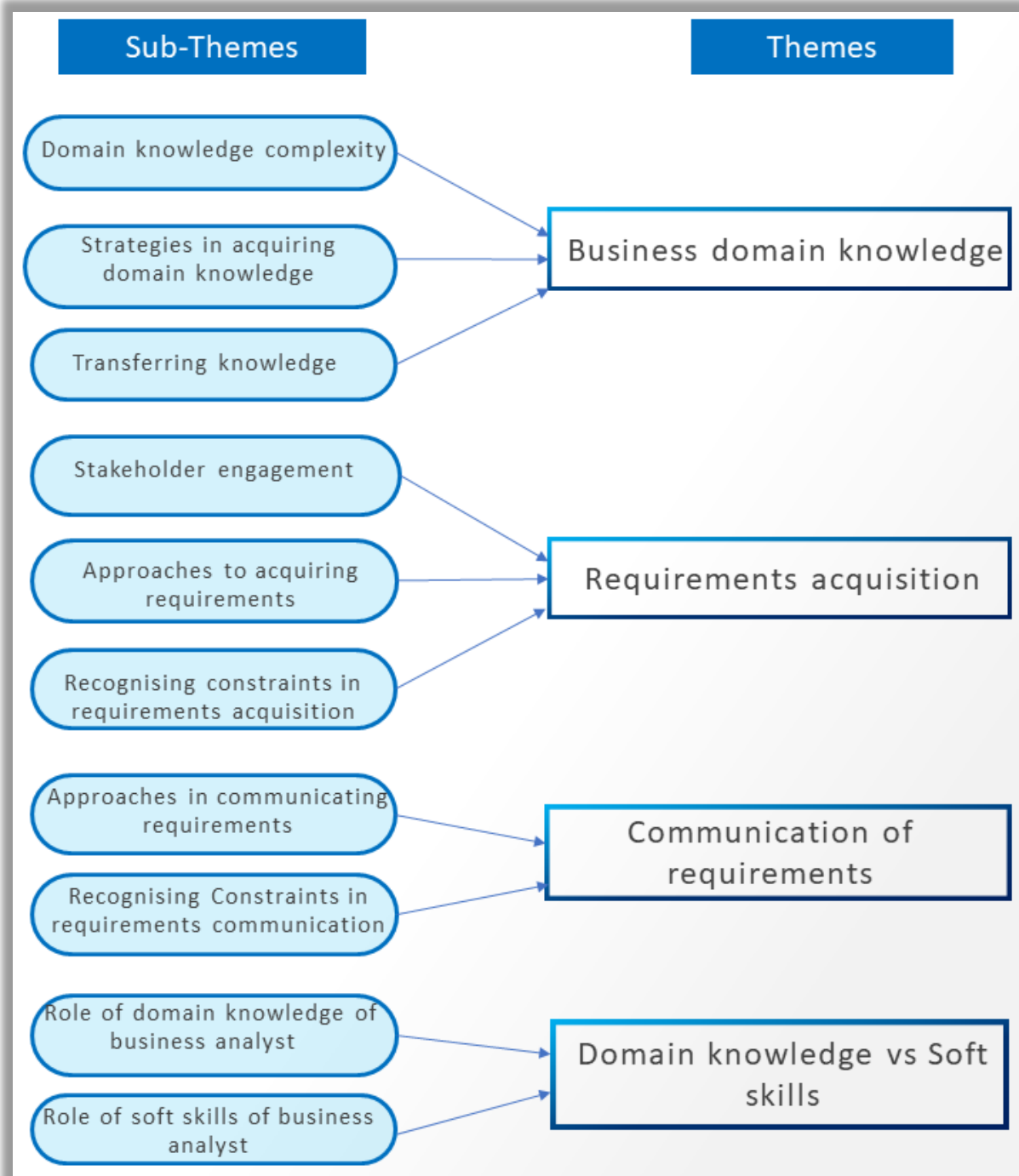


Figure 3.2: Construction of themes from sub-themes

In the sixth and final phase, I projected the findings into the chapter 4 of my research report with the themes presented in a logical sequence as a narrative to provide plausible answers to my research questions.

3.4 Ethical considerations

As part of the ethical considerations, a detailed participant information sheet was shared with participants and consent form to be signed by participants. The participant information sheet (attached as appendix E) gives broad details of the purpose of the research and the consent form (attached as appendix F) emphasising on the elements of confidentiality, anonymity, and voluntary nature of the research. At the time of recruitment, participants were also provided with the basic framework of the interview, and its approximate duration. The location for the face-to-face interviews was decided with due acceptance of the participants. Audio-recording of interviews was done only after the participants agreed. The recordings were transferred to my password protected laptop and transcriptions done by me were saved as password protected files in the same laptop. Participants' names and identities have not been disclosed in the research to protect their privacy. Code names are used instead of real names while discussing the research findings. Other identifying material such as organisation's name have been excluded.

Chapter 4 Findings

4.1 Introduction

This chapter provides the findings from the thematic analysis done on responses of the ten business analysts who were interviewed. The analysis of the responses produced four main themes and ten sub-themes. I present the themes and sub-themes in this chapter supported by the participants' quotes. The aim is to use these main themes and sub-themes to provide a clear overview of the participants' experiences, perceptions and perspectives related to the research questions. The main themes identified are: (a) business domain knowledge; (b) requirements acquisition; (c) communication of requirements; and (d) domain knowledge vs soft skills. The construction of sub-themes and themes from the codes is shown in table 4.1.

Table 4.1: Construction of sub-themes and themes from codes

Codes	Sub-themes	Themes
Complexity in domain, complexity in sub-domains, inadequate domain knowledge, complexity in project	Domain knowledge complexity	Business domain knowledge
Self-learning, keeping up to date, acquiring knowledge from domain experts, on-the-job training, learning from documents, training via LinkedIn	Strategies in acquiring domain knowledge	
Knowledge from previous experience, knowledge of different domains, experience of different domains, knowledge transfer from other employees	Transferring knowledge	
Understanding the client, getting information from the client, building rapport, sharing ideas, keeping the client updated, meeting the client's requirements	Stakeholder engagement	Requirements acquisition
Conducting workshops, using business scenarios, understanding the client's business process, conducting interviews, documenting the requirements, analysing client requirements, using waterfall methodology, using agile methodology	Approaches to acquiring requirements	
Understanding domain terminologies, upskilling, challenging due insufficient time	Recognising constraints in requirements acquisition	
Writing user stories, using visual representation, using tools, using verbal communication skills, giving clarity, balancing, following up with team	Approaches to communicating requirements	Communication of requirements
Explaining the requirements, convincing the team, solutionising the requirements, dealing with team resistance, dealing with personal issues, explaining the requirements, understanding accents	Recognising constraints in requirement communication	
Acquiring functional requirements, transitioning faster, using domain experience, preferring domain knowledge	Role of domain knowledge of business analyst	Domain knowledge vs
Using business analyst skills, being curious, listening skills, using analytical skills, convincing skills, problem solving skills	Role of soft skills of business analyst	Soft skills

In the following sections, I present and explain the themes and sub-themes with supporting quotes from participants. For reader clarity, I have font-changed the codes and inserted it in square brackets throughout this chapter.

4.2 Business Domain knowledge

The review of literature showed that the role of business domain knowledge of business analysts is crucial to the success of ISD projects. The first theme that is developed in my research from participants' responses is also business domain knowledge with its three sub-themes: (a) domain knowledge complexity; (b) strategies in acquiring domain knowledge; and (c) transferring knowledge.

4.2.1 Domain knowledge complexity

Though it is understood that any domain could have its own complexities, some of my participants had perceptions that certain domains are more complex than others. Domain complexity may be attributed to the terminologies (jargon in RX's words) and the longer time required to gain knowledge in some domains. Domains that involved more arithmetic and calculations, e.g., taxation, finance, and insurance, are considered more complex than other domains (KX and AX). Domain knowledge is considered to be particularly important when handling projects in complex domains (RY). Overall, the business analysts' lack of domain knowledge creates difficulties when they start working in domains new to them, especially in complex domains.

"The domain knowledge is so essential that wherever there is a lot of jargon related to a particular field as I found it really difficult to move from the taxation and financial services field to telecom field [Complexity in domain] because they are totally different although the underlying process of working as a business analyst is the same." (RX)

"I know it gets very complex in the pricing and actuarial side of work because when you calculate the mortality rates, the factors go into the calculation are complex [Complexity in domain]. Your customers, need of your customers define how complex or how easy a business should be." (KX)

"It is good to have domain knowledge if the project is complex [Complexity in project], for example, good to know terms like what negative interest rate in financial domain is." (AX)

"The challenge of domain knowledge is in complex domains, for example, network infrastructure is a complex domain [Complexity in domain]. (RY)

There could be similarity or difference in business analysts' perceptions on what are the complex domains. For example, insurance is considered to be a complex domain by some participants (IX and DX) because it is difficult to understand the domain well in the beginning (IX). In contrast, the perceptions on banking domain varied between complex (DX) to simple (RY). In some cases, a domain could have some complex subdomains and simple subdomains (DX). The differences in business analysts' perceptions on complexity of domains could be underpinned by lack of experience in a particular domain.

“I have worked only in insurance domain, but initially there was a hiccup because insurance domain is very complex [Complexity in domain].” (IX)

“When you are working in banking and insurance, they are complex domains. There could also be some subdomains that are more complex than the others [Complexity in sub-domains].” (DX)

“Banking domain is far simpler than network domain in terms of technical understanding and expertise you need. Security domain, I would say is also a complex domain [Complexity in domain].” (RY)

Business analysts’ lack of domain knowledge could result in inadequate requirements acquisition (RY) and difficulty in achieving ISD success (AX).

“If you don’t have domain knowledge, you might not capture something which is very crucial, for example in airlines domain, you should know the underlying facts of the domain and what are the next steps in the process [Inadequate domain knowledge].” (RY)

“One project I was offered was because the person previously working on it didn’t have the domain knowledge and they were struggling to deliver what the client required, and the client was not too happy [Inadequate domain knowledge].” (AX)

The construction of the ‘domain knowledge complexity’ sub-theme with its codes is shown in Figure 4.1.

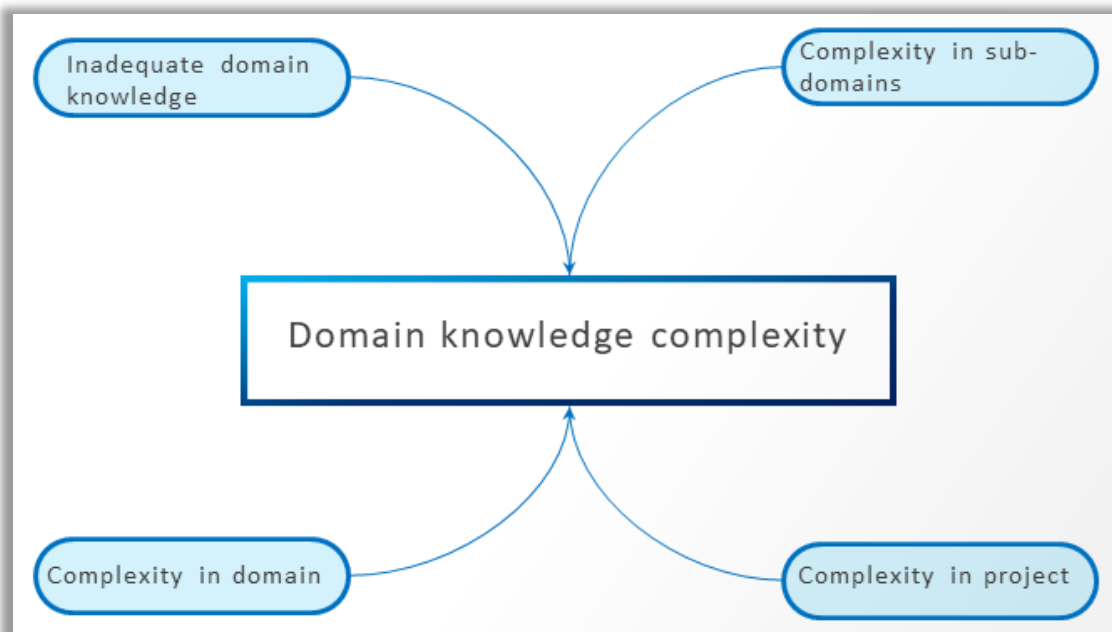


Figure 4.1: Construction of domain knowledge complexity sub-theme

4.2.2 Strategies in acquiring domain knowledge

The strategies and means for acquiring domain knowledge include self-learning by reading books or articles or through the internet, undergoing training courses including through LinkedIn, learning from subject-matter expert or domain experts and from organisational repositories. Most of the time, it is the business analysts' own passion and efforts that drive the process for them to gain domain knowledge (KX, RY, AX and NX). This is also because many organisations may not have readymade material available for business analysts to quickly gather domain knowledge (KX). Business analysts should keep themselves abreast with new developments that are taking place in the domain they are working in so that they are not found wanting (RY). Keeping oneself up to date with domain knowledge is particularly crucial in domains such as healthcare where any mistakes in ISD could seriously endanger the health of patients (AX). It is advisable for business analysts to use all means, for example, self-learning, perusal of existing documents on the domain and approaching domain experts, to quickly gather sufficient domain knowledge so that they can effectively contribute to ISD success (NX and KX).

“Domain learning depends more on research rather than having something readily available for you [Self-learning]. Also, you can't expect the person who was there before you would have done robust documentation, that is my experience, it will be all broken.” (KX)

“It is all up to the business analyst to update himself with any new information that is coming, even maybe news feeds in the domain [Keeping up to date], depending on how important that is to the project or to the organisation.” (RY)

“I do my research on google about the project and the domain that surrounds the project [Self-learning]. We have to continuously learn, so if it is healthcare, we need to keep reading articles, or may even subscribe to articles to understand what is new happening in the domain [Keeping up to date]. Because, in healthcare projects, you don't want to misinterpret something or give out a wrong software or application that can hurt your patient.” (AX)

“I think one month is a good enough time to understand a project, there could be your own research, document analysis, interaction with domain experts or whoever, when you are trying to understand the project [Acquiring knowledge from domain experts].” (NX)

“Research on domain could be what you read up, exploring google [Self-learning], or talking to people or friends across different companies in the same domain. That is what I did in my initial days in insurance and banking, to gather knowledge, and bridge the gaps wherever there was a need.” (KX)

The role of domain experts is particularly crucial for business analysts to gather domain knowledge. This is because the domain experts or subject-matter experts know the entire details of the domain and can help business analysts in effectively contributing to ISD related to the domain (IX). Domain experts are also helpful in quickly clarifying any doubts that business analysts may have related to the domain, program, or product (NX). Over a period of time, the learnings from domain experts could help in business analysts themselves becoming domain expert (RX).

“You talk to a lot of people, subject matter experts [Acquiring knowledge from domain experts]. basically, they know the product in and out, and you also learn during your job [On-the-job training].” (IX)

“You might find a lot of things online, but there will always be those peculiarities in the business domain you are working that you need to understand, and for that you need the subject matter experts. When you go to them you can confirm your assumptions and then you understand the business [Acquiring knowledge from domain experts].” (NX)

“If I have to be a very good business analyst or to be in scrum master role, I need to get that domain knowledge from proper sources [Acquiring knowledge from domain experts] and only then I could move ahead.” (RX)

It is not often that business analysts get sufficient support from their organisations to enhance their domain knowledge. Only a few organisations may have a well-maintained knowledge repository through which business analysts can quickly learn about the domain and product (IX). More often, the documents maintained in organisations contain fragmented information which is not very useful for business analysts to understand about the processes involved and the process flow (KX). Sometimes, the excessive use of acronyms in the maintained documents makes it difficult for business analysts to quickly grasp the available domain knowledge (EX). Organisations should support business analysts to attend training courses so that they gain domain knowledge (RY). Another way organisations could support business analysts is by having domain experts who are readily available for business analysts to consult and gain domain knowledge (RX). Organisations could also facilitate the business analysts' learning by initially making them attend and observe requirements acquisition sessions conducted by experienced business analysts, till they become confident of independently carrying out the sessions (KY).

“I have worked in organisations where they had fantastic learning material with them, so even if you are new to insurance domain or to the product, it was not difficult, you can ask and get the material and go through them [Learning from documents].” (IX)

“I feel it is easier to access if they have a proper process of document maintenance, a document repository. There is a process and a separate team to take care of your

entire document and training needs and that is more of an organised structure [Learning from documents]. There will be documents, but they will all be broken, you will never get that specific knowledge set, like this is process A, from process A it flows to process B and the entire roadmap.” (KX)

“The current organisation that I am working with supports learning. I have also enrolled to LinkedIn training [Training via LinkedIn], that is one big platform touching every domain. (RY)

“When I spent more and more time on some other projects, I came to know there were other tax types in the department and they also had subject matter experts who were working as a kind of adviser to business analysts - not a technical analyst, but business side. Their main job was to just disburse that domain knowledge to whoever are looking for it [Acquiring knowledge from domain experts].” (RX)

“It is important to have a subject matter expert or domain expert throughout the project because the business analyst, when switching domains might not always have domain knowledge [Acquiring knowledge from domain experts]. ” (KX)

“As part of training, in the initial days, the business analysts are included as part of customer calls so that they can understand what is happening, what kind of questions customer ask, what are the problem areas and how other business analysts are responding to those queries, and how requirements are captured [On-the-job training]. Then, you can apply your domain knowledge to understand the problem area, and how that can be configured.” (KY)

Figure 4.2 shows the construction of ‘strategies in acquiring domain knowledge’ sub-theme with its corresponding codes.

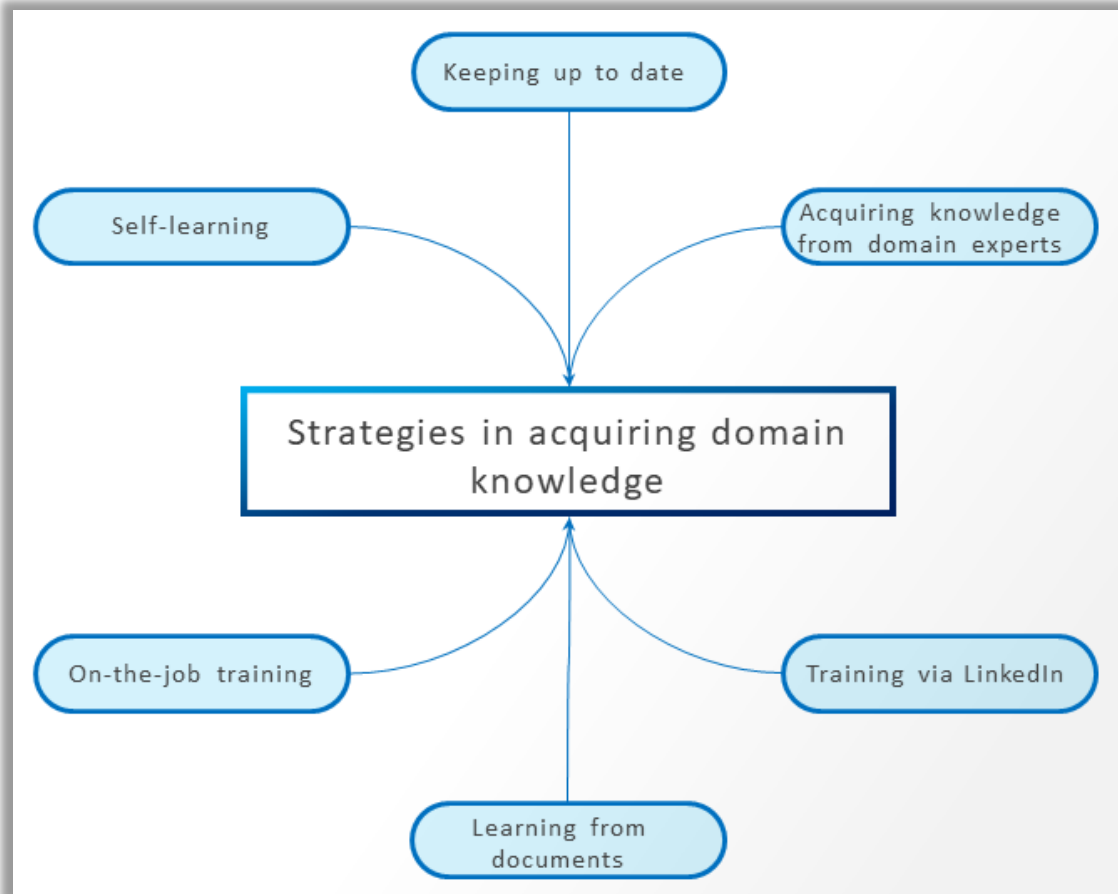


Figure 4.2: Construction of strategies in acquiring domain knowledge sub-theme

4.2.3 Transferring knowledge

Business analysts' domain knowledge is transferable from one past project to a new project of the same domain due to the domain experience gained (AX). Also, business analysts can perform faster in new domains by understanding the commonalities they observed in different domains they had earlier worked in (EX and NX). Knowledge is also transferred to business analysts when they work with different teams, with learnings gained from each team (IX). Hence, it is essential that organisations have a strategy so that business analysts experienced in a particular domain can transfer their knowledge to business analysts who are new to the domain (AX).

"The learning curve get shortened if you have previous work experience [Knowledge from previous experience] but if it's a new domain, with your BA skills you can always learn the domain." (AX)

"I think most business analysts who have knowledge of different domains [Knowledge of different domains] can just build the pieces together, when in a new domain." (EX)

After you have had experience in different domains [Experience of different domains], you will know the pattern, so when you go into something new, do not worry, it could look

really daunting, but you have to be like you have done this before, you can do it.”
(NX)

“Slowly, the learning curve comes, what I learnt from team to team differed, but at least with the teams I have worked [Knowledge from previous experience], I have always improved on my processes.” (IX)

“There can be someone within the organisation who can give knowledge transfer who would have worked on similar projects [Knowledge transfer from other employees] before you go to the client. If there is someone who has worked on similar projects or currently working in the project prior to you, they give knowledge transfer before you actually go and meet the client.” (AX)

The construction of ‘transferring knowledge’ sub-theme with its codes is shown in Figure 4.3.

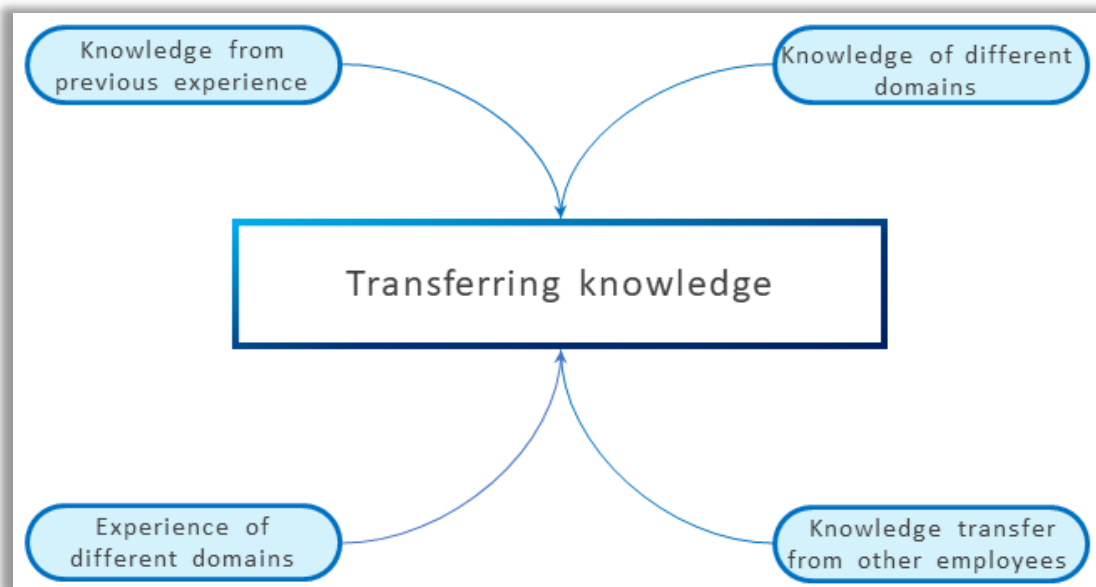


Figure 4.3: Construction of transferring knowledge sub-theme

4.3 Requirements acquisition

The second theme derived from the participants’ responses is ‘requirements acquisition’ with its three sub-themes: stakeholder engagement, approaches to acquiring requirements, and recognising constraints in requirements acquisition.

4.3.1 Stakeholder engagement

Stakeholder engagement is one of the first steps taken in the requirements acquisition process. For effective requirements acquisition, it is important for business analysts to understand the stakeholder’s role in their companies, their behaviour and way of functioning (RY). This understanding helps

business analysts to build rapport and trust with the clients for effective requirements acquisition, not only during the current project but also in future projects where they might work together (RY and KX).

“First thing before requirements acquisition, I would say, understand the stakeholders, their behaviour, what is their role and way of working [Understanding the client].” (RY)

“I was taking some time to understand the domain or the way the client’s organisation works. I couldn’t understand anything in one meeting, but I could always go back to stakeholders at later point of time to reflect back on what I understood and get more information out of them [Getting information from the client].” (RY)

“When dealing with stakeholders, you think in the long-term, because it is important to have your stakeholders accompany you throughout the entire project [Building rapport]. Also, these are some stakeholders you may need to go back when you do future projects.” (KX)

Building rapport and trust with clients is possible only if the business analysts possess sufficient domain knowledge. This is because the clients also expect the business analysts to share some knowledge useful to them during the requirements acquisition process (KY). The clients’ trust in business analysts grows even more when they are kept promptly informed and consulted by business analysts about any changes being made during the ISD and their possible impact (KX). However, the clients develop complete trust in business analysts only when they see that the analysts have contributed effectively to delivery of a successful program or product (NX).

“You just cannot go for getting the requirements from the customer, even the customer will expect some kind of information from you, for example, there was this customer who was facing some issues with the merit matrix configuration. You are also giving some value to the customers by sharing your ideas and thoughts [Sharing ideas].” (KY)

“It is important to timely inform your stakeholders about all changes that are being made and their impacts. Typically, we speak about a stakeholder engagement plan which tells about who should be informed [Keeping the client updated], who is accountable, and what are the risks.” (KX)

“I think you get respect from the customers when they see you deliver a project, a product, they can see that you have put in the effort, that you made sure that everything is intuitive, and everything is making sense [Meeting the client’s requirement].” (NX)

The construction of the sub-theme ‘stakeholder engagement’ from the codes is shown in Figure 4.4.

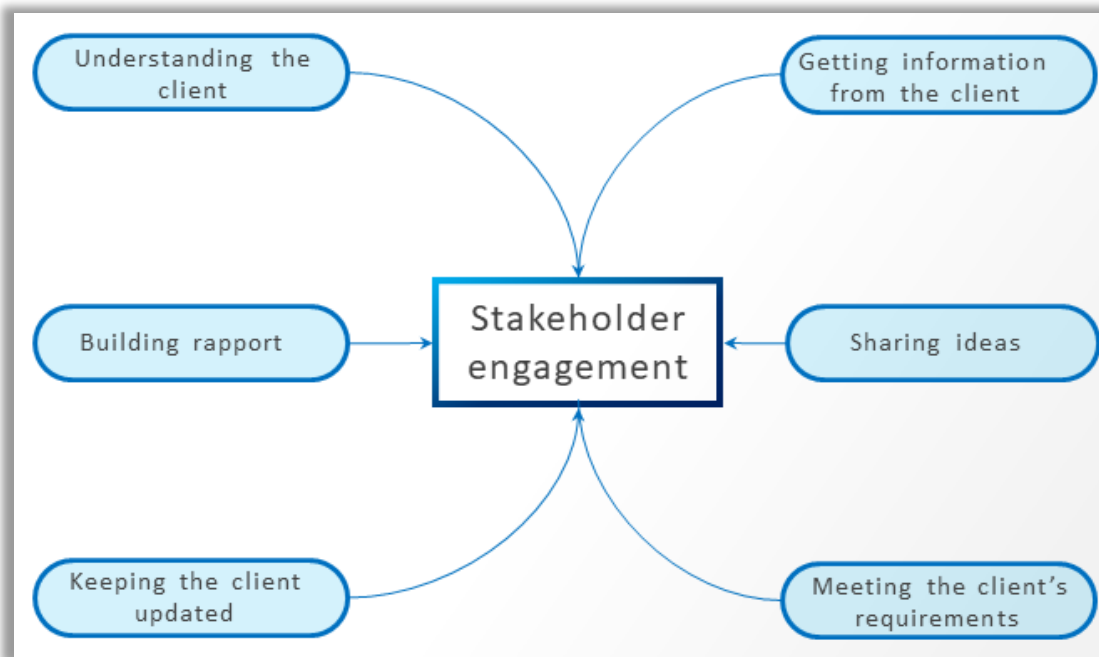


Figure 4.4: Construction of stakeholder engagement sub-theme

4.3.2 Approaches to acquiring requirements

The approach to acquiring requirements could differ depending on the existing practice in organisations as well as on the business analyst. Though not fully equipped with domain knowledge, some business analysts feel that they can gain the required knowledge during the requirements acquisition sessions (IX). However, this is not a correct approach to acquire requirements as business analysts will not be able to properly discuss business scenarios with clients without adequate domain knowledge (KY). Consequently, business analysts should approach acquiring requirements with sufficient domain knowledge including knowledge of the business processes to understand how the solution needs to work (AX).

“I think you can still sail the boat and learn a lot of domain knowledge along the way and understand their business when you interact with the clients, doing the workshops [Conducting workshops].” (IX)

“Domain knowledge helps business analysts to start working from day one. Without domain knowledge, yes, it is not easy to go and talk to the customers, especially discussing the business scenarios [Using business scenarios]. They can always learn it in a few weeks and start interacting with the customers well.” (KY)

“While talking to the stakeholders, you need to understand the business process and how the solution has to work [Understanding the client’s business process]. (AX)

Though various approaches are available for acquiring requirements with the use of different techniques and tools, interviews are the most commonly practiced approach. It is important for business analysts to go with a well-structured questionnaire for interviewing the client so that they can effectively elicit the requirements and document the proceedings in an organised manner (NX). The unstructured interviews carried out by inexperienced business analysts could become very time-consuming and ineffective (RY).

“I always go with a very structured interview process so that I’m not wasting the client’s time [Conducting interviews]. Then, work my way through all the information, make it clear and organised in a nice format and know how to present it.” (NX)

“When I went for requirement gathering, I was not the expert, I had to ask some open questions like what this is, what are the requirements, and why those kinds of things [Conducting interviews].” (RY)

It is understood that business analysts should have both domain knowledge and the documentation skill to produce precise, and comprehensive requirements prescriptions documents. Business analysts should listen carefully to the clients and meticulously note down every detail to develop proper requirements prescriptions documents (CX). It is also important that these documents are well created so that the stakeholders understand them easily (AX).

“We have to be very sharp in documentation skills, observe the information, and document all that stuff, even if it is for our own understanding [Documenting the requirements].” (CX)

“When you start getting the requirements, and at this point, you are not judgmental at all, you take in whatever the clients are saying and keep jotting them down. And once this is done, you start writing your requirements in a manner that all the business stakeholders can understand [Documenting the requirements]. (AX)

Business analysts’ domain knowledge is important in the requirements analysis. In fact, both domain knowledge and product knowledge help business analysts to analyse the multiple business scenarios to find out exactly what the clients need from the information systems (KY).

“In general, each domain has its own complexity. You apply domain knowledge more when you are doing requirements analysis, there could be multiple scenarios, that is when you do in-depth review of what clients want. You are doing analysis keeping both product knowledge and domain knowledge in your head [Analysing client requirements].” (KY)

The role of business analysts’ business domain knowledge varies depending on whether they handle projects using waterfall or agile approaches or methodologies. In the waterfall methodology, it is

necessary for business analysts to equip themselves with adequate domain knowledge before beginning requirements acquisition. In contrast, in agile methodology, business analysts may have the opportunity and time to periodically strengthen their domain knowledge during the numerous sprints (IX and NX).

“Waterfall has long phases and a business analyst who has no domain knowledge will get more time to understand the domain, requirements and then write the requirements [Using waterfall methodology]. But then in agile even if you make a mistake while delivering, there’s a next sprint in which you can rectify that mistake and that is not possible in waterfall method.” (IX)

“In waterfall, it would take more time to understand the domain and all the requirements because there is not a lot of collaboration unlike in agile. In agile, you can learn the domain as you work with the customer and the team in different iterations [Using agile methodology] whereas in waterfall, you need to do a lot of research before the design starts.” (NX)

The construction of ‘approaches to acquiring requirements’ sub-theme with codes is shown in Figure 4.5.

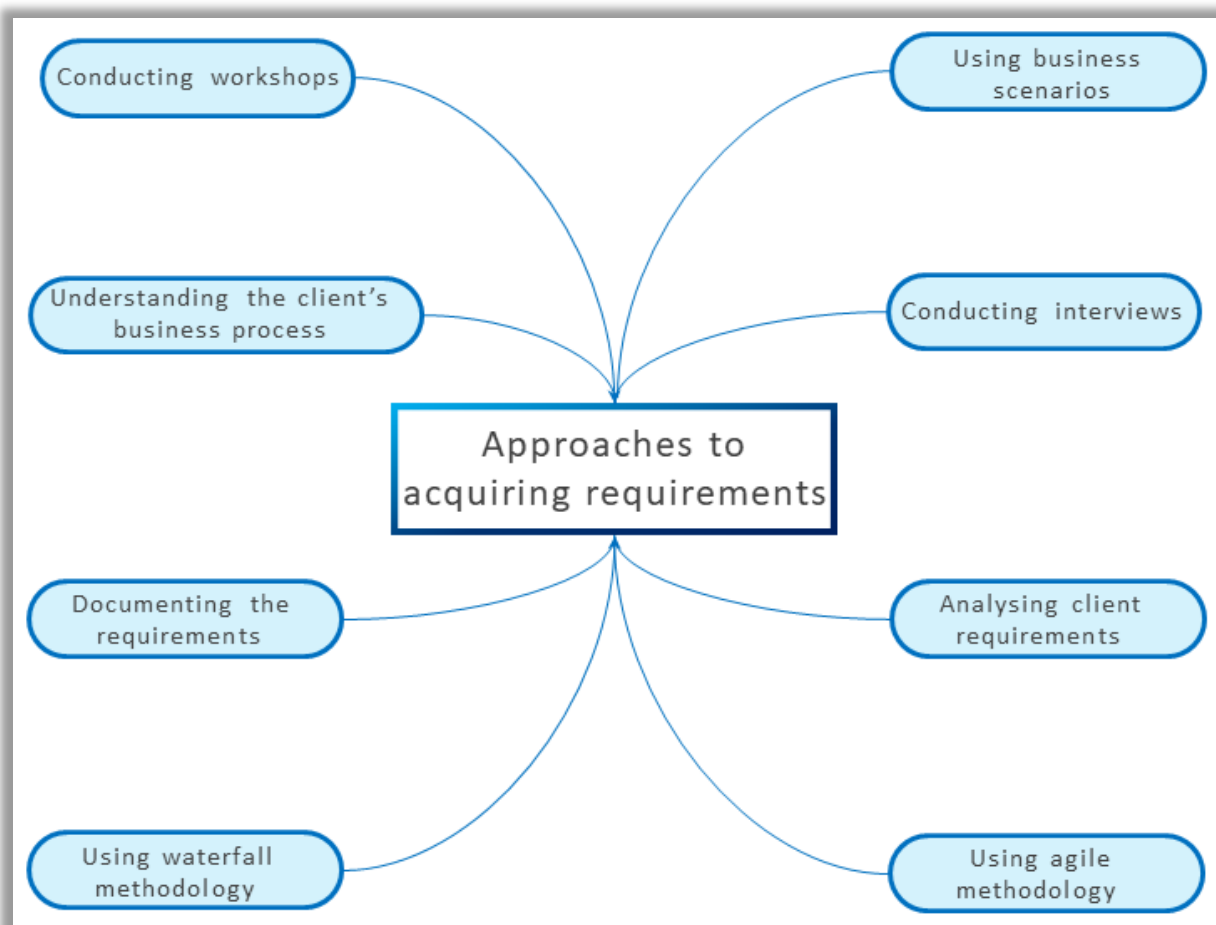


Figure 4.5: Construction of approaches to acquiring requirements sub-theme

4.3.3 Recognising constraints in requirements acquisition

There could be various constraints for the business analysts during the requirements acquisition process which if not addressed well could result in ISD failures. For example, one of the constraints could be the business analysts being not familiar with the domain terminology. Business analysts' lack of familiarity with domain terminology is a major constraint, especially in the beginning of requirements acquisition (RY). Such constraint could be especially significant while handling projects of highly technical nature, for example, networking projects (RY). It is also difficult for business analysts who are not well-versed with domain knowledge to understand the requirements when the clients use lot of domain terminology in the requirements acquisition phase (RX and AX). Therefore, business analysts should become conversant with domain terminology so that they are able to elicit the requirements effectively and prepare user stories (NX).

We can understand the problem statement only if we can understand the domain terminologies [Understanding domain terminologies]. After a month, you are in a bit more solid state.” (NX)

“In the initial requirement gathering, I hadn't any clue about what they were talking about because it was very technical, and networking, it is a big sea and there is a lot to learn in the initial stages. You need to understand what the customers are talking about. They will constantly use terms you should be aware of, and for that you need to upskill yourself [Upskilling].” (RY)

“The place where domain knowledge is so essential is, where there is a lot of jargon [Understanding domain terminologies].” (RX)

“You may get surprised when you talk to the client, they may throw some terms at you [Understanding domain terminologies].” (AX)

“Once you understand the domain, you can put up your user stories, present that information which you took ages to understand, the figures and trends [Understanding domain terminologies].” (NX)

The short timelines available for completion of projects is another difficulty that business analysts face in information systems. This difficulty could be handled by frequent meetings with clients so that the tasks get streamlined and expedited (KX). Such meetings with clients also help business analysts to verify and validate whether the requirements prescriptions meet the business requirements (KX). Another way for business analysts to expedite requirements acquisition is by getting assistance and clarity from subject matter experts or domain experts.

“If you can’t get time, that has been challenging, but I think what works well is a mix of having weekly catchups and prioritisation [Challenging due to insufficient time], a standard project plan where you can actually talk about classifying different phases, where you align the tasks, and where you can mention the dependencies.” (KX)

“If you do not have enough timeline when something new comes in, it can be difficult to learn new things for gathering requirement [Challenging due to insufficient time].” (RY)

The construction of ‘recognising constraints in requirements acquisition’ from its codes is shown in Figure 4.6.

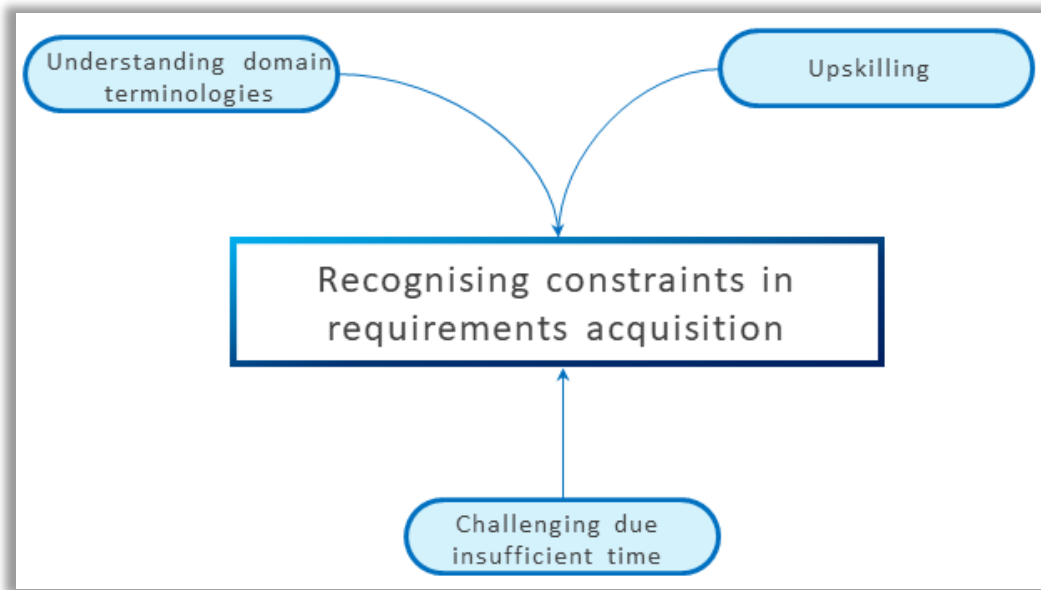


Figure 4.6: Construction of recognising constraints in requirements acquisition sub-theme

4.4 Communication of requirements

The third theme developed from the participants’ perceptions is ‘communication of requirements’, with its two sub-themes: (a) approaches to communicating the requirements; and (b) recognising constraints in requirements communication.

4.4.1 Approaches to communicating requirements

Business analysts are required to transform the client requirements and problem statement into user stories and requirements prescriptions which are communicated to developers for software development. Some business analysts may prefer to use a simple whiteboard to visually explain the requirements so that the developers can easily understand them (AX). Visual communication of requirements is also handy when there is a language barrier between the business analysts and developers (DX). Alternatively, business analysts may use different tools for communication of requirements, for example, Microsoft Teams, and Visio type of tools (RY).

“I ensure that while writing user stories [Writing user stories], that they are well understood by the clients as well as by the developers. I normally get into a meeting and have a whiteboard for a visual representation, a picture is worth a thousand words is actually true.” (AX)

“Once, there were three mainland Chinese developers, and it can be a challenge. But if I draw a picture on the board [Using visual representation], they get it, they can understand the picture. Simplifying things and getting back to basics is very worthwhile exercise.” (DX)

“Microsoft Teams is really good collaborative tool where you can just add in the details and easy to share in a collaborative way. There are Jira, Microsoft suites, Visio type of tools are mainly used for communicating the requirements [Using tools].” (RY)

It is known that business analysts’ verbal communication skill plays an important part in communication of requirements to the developers. Business analysts’ verbal communication skill is important not only in requirements acquisition but also for communication of requirements to developers (EX). The skill enables business analysts to clearly answer questions that some developers may ask about the entire requirements acquisition process, including clients’ needs, problems, and the analysts’ responses (KY). Verbal communication is also important for business analysts to create a shared understanding of the requirements by clients and developers (AX).

“I would definitely say that communication skills are important, getting something from customers [Using verbal communication skills] on what they really want is fine, but giving someone work, the technical people really want to push back on it.” (EX)

“There will be questions by the development team when I discuss the requirements. They want to know what kind of questions the customers asked, what are the problem areas, how I responded to the customers’ queries, and how requirements were captured [Giving clarity].” (KY)

“Though the business stakeholders normally talk also to the development or testing team, I, as a business analyst, make sure that they both are quite in line and understand each other [Balancing].” (AX)

Business analysts may be required to do an analysis of feasible solutions before they communicate the requirements prescriptions to developers (KX). Business analysts should be constantly in touch with the developers to ensure ISD success (DX). It is also the responsibility of business analysts to succinctly communicate to the developers what has been agreed with the clients about the software to be developed (participant IX).

“In requirements acquisition, ideas convert into needs, needs convert into requirements, and from the requirements we do a feasibility analysis and then you start communicating the right things to the developer [Giving clarity].” (KX)

“Sometimes, you need to reflect on the learnings here, why we are struggling with this. Sometimes, the answer is obvious and why you would share that with the team. Constant communication is really important [Following up with team].” (DX)

“You have to communicate with your developers about what you have agreed upon with the business after getting the requirements and sign off done is being implemented that way and then test it [Giving clarity].” (IX)

The construction of ‘approaches to communicating requirements’ sub-theme with its codes is given in Figure 4.7.

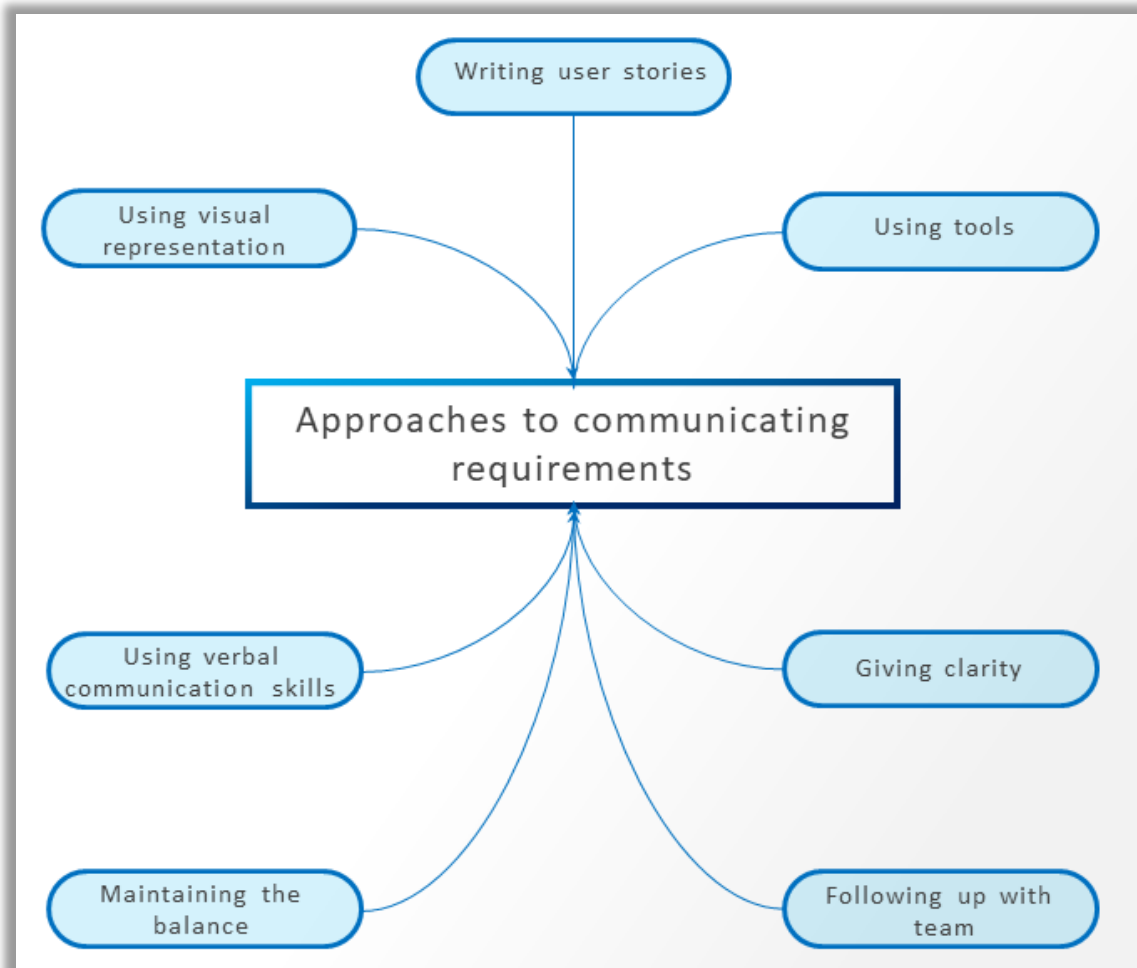


Figure 4.7: Construction of approaches to communicating requirements sub-theme

4.4.2 Recognising constraints in requirements communication

There are various constraints faced by business analysts in communicating the requirements to the developers. One common constraint is the business analysts' unfamiliarity with domain terminology which makes it difficult for them to understand the problem statement and communicate the requirements (EX). Sometimes, it is also difficult for business analysts to convince both clients and developers on the requirements prescriptions that they had developed (AX). There could be situations when business analysts get challenged by developers who tell them to give just the requirements and not the solutions (AX and NX). A more serious constraint in communication of requirements is when there are personal issues between business analysts and developers (DX).

"When it comes to dealing with technical team [Explaining the requirements] you need to know what each domain terminology means, but it is kind of complex." (EX)

"Convincing the business stakeholders and technical team can be an issue sometimes [Convincing the team]. A good business analyst needs to know how to balance the two." (AX)

"Developers or architects will push back on requirements saying that don't solutionise or you write your user stories that give solution [Solutionising the requirements]." (AX)

"You have completed your requirement gathering, done all your research and analysis and when all the stakeholders come up with a solution, someone from the internal team can challenge you [Dealing with team resistance]. As a business analyst, you need to have an open mind and get a hold of the situation." (NX)

"One of the issues in communicating or collaborating with the team could be personal issues [Dealing with personal issues]." (DX)

Business analysts' inadequate verbal communication skills is an important constraint in the communication of requirements. Despite having sufficient domain knowledge, the lack of verbal communication skill could affect the business analysts in effectively communicating the requirements to the developers (RX). When the business analyst and developer belong to different countries, the difference in their accent could also become a constraint in communication of requirements (RY).

"I had the domain knowledge but then the challenge I faced was to actually communicate that domain knowledge to the technical team, also, why are we doing it and what do we want to achieve after doing it [Explaining the requirements]." (RX)

“Verbal communication is a challenge when you move to the southern hemisphere here in New Zealand, the accent is so different, that was a big challenge in terms of building rapport with the team members [Understanding accents].” (RY)

The construction of ‘recognising constraints in requirements communication’ sub-theme with its codes is given in Figure 4.8.

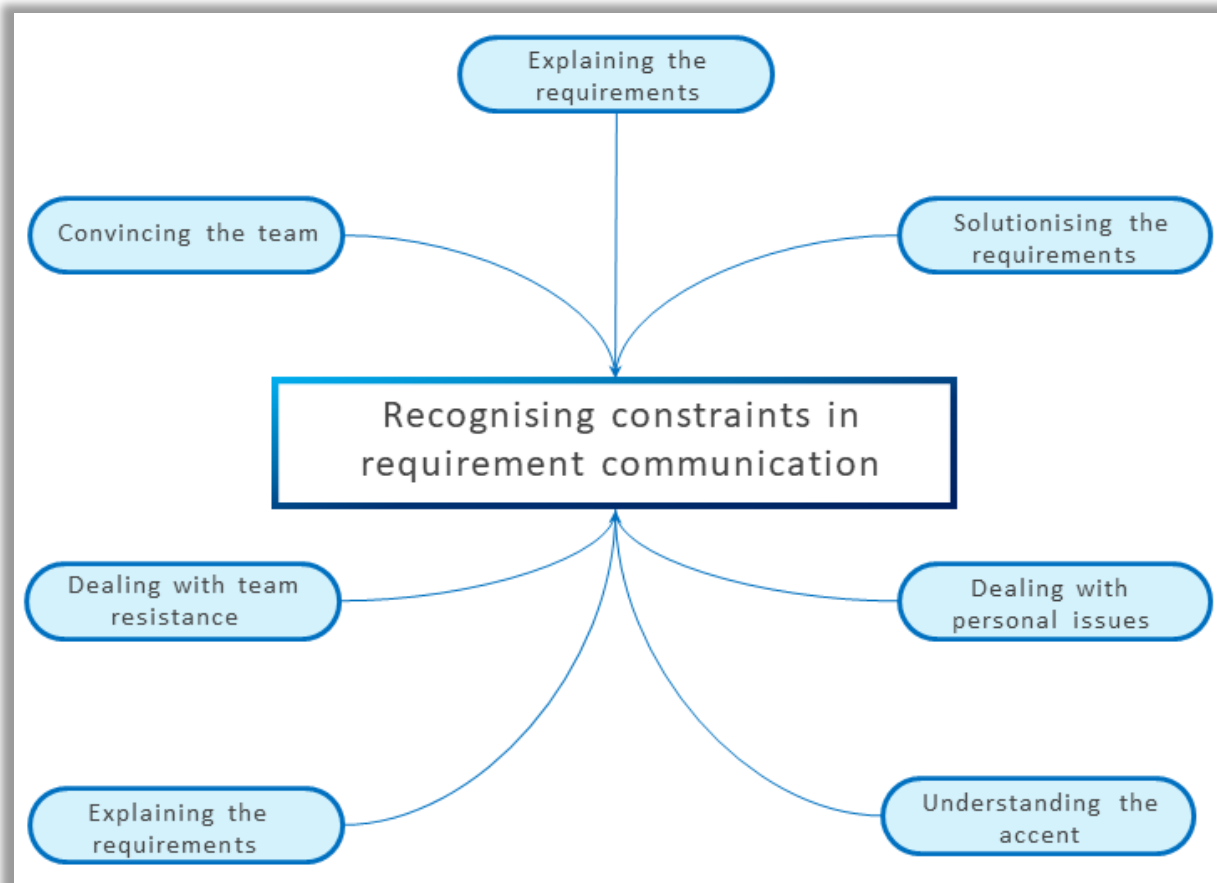


Figure 4.8: Construction of recognising constraints in requirements communication sub-theme

4.5 Business domain knowledge vs soft skills

The fourth and final theme constructed from the participants’ perceptions is the role of business domain knowledge vs soft skills in requirements acquisition and communication of requirements. The two sub-themes under the theme are accordingly role of domain knowledge of business analysts, and role of soft skills of business analysts.

4.5.1 Role of domain knowledge of business analysts

There is adequate evidence in literature on the role of business domain knowledge of business analysts in requirements acquisition and communication of requirements. Business domain knowledge could be

more important than soft skills when business analysts work on the functional requirements (RY). Business analysts who lack domain knowledge are likely to take more time to effectively elicit client requirements (IX). Sometimes, business analysts' previous domain experience may be required in addition to their domain knowledge for effective communication of requirements (DX).

"I think generic business analyst skill is fine, but from there when you go in detail where you need detailed functional requirements [Acquiring functional requirements], that is when the domain knowledge comes in play." (RY)

"If we already have domain knowledge, then things will move faster [Transitioning faster], but well, in the other case where you have just the business analyst skills, it will be moving, but that might not be in the same pace, might be of slower pace." (RY)

"When the requirement elicitation phase starts, that is when you need a person who has good domain knowledge, if not very great. Obviously, a business analyst who has no domain knowledge will need more time to understand [Transitioning faster] and write down the requirements." (IX)

"You may have tacit knowledge, but you cannot communicate that well unless you have good domain experience [Using domain experience]." (DX)

There are situations where employers specially look for domain knowledge in the curriculum vitae of business analysts because it is more difficult to quickly evaluate soft skills of business analysts during the selection process (RX).

"In New Zealand, during recruitment, they look just for domain knowledge and experience, and thought that my skills from India are not transferrable [Preferring domain knowledge] to New Zealand, my analysing skills, documenting, creating process maps, excel skills, and even some technical skills like backtracking from the code and reverse engineering code to produce the business rules." (RX)

The construction of 'role of domain knowledge of business analyst' sub-theme with its codes is shown in Figure 4.9.

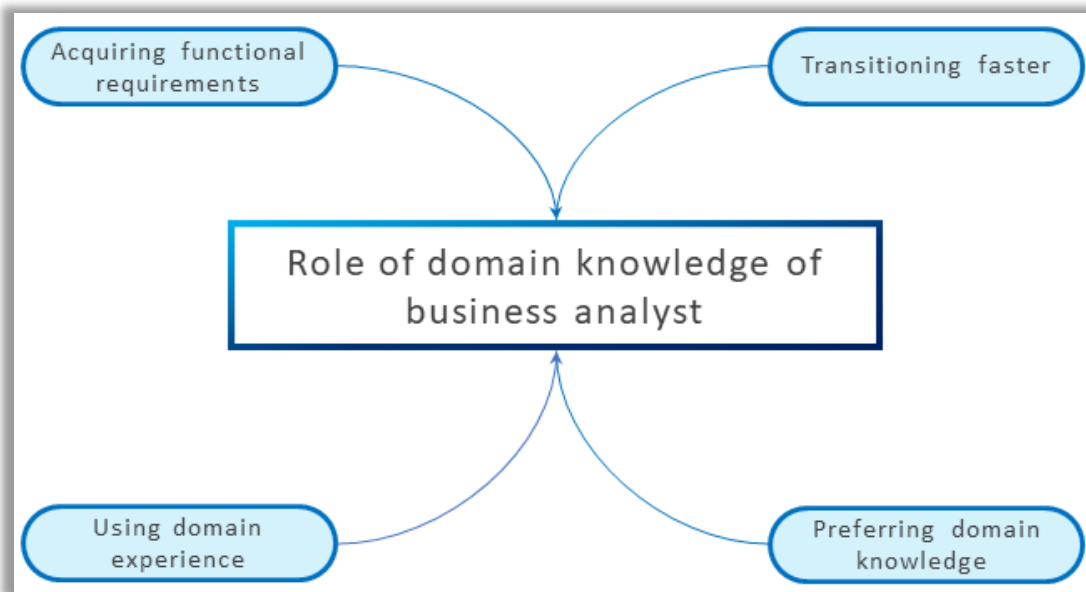


Figure 4.9: Construction of role of domain knowledge of business analyst sub-theme

4.5.2 Role of soft skills of business analysts

Though business analysts' domain knowledge is important in handling ISD projects, soft skills may be more important when handling new projects (AX). Soft skills may be more important than domain knowledge for business analysts when they are required to work in multiple domains or subdomains (RY) or in new domains (KX). However, it can be inferred that business analysts should have both domain knowledge and soft skills for a good performance in ISD.

"Whenever you start any new project, the learning curve gets shortened if you have previous work experience in that domain, but if it is a new domain, if your business analyst skills and foundation are strong, you can always learn the domain knowledge [Using business analyst skills]." (AX)

"If you have good business analyst skills, domain knowledge is secondary, you can survive in any domain [Using business analyst skills]." (AX)

"In a business analyst journey through a project, you may have to wear different hats, you may have to interact in other domains or subdomains, so having your basic business analyst skills ready is the biggest factor [Using business analyst skills]." (RY)

"I did have a challenge while moving from insurance and banking to retail, but what worked for me was being able to use my business analysis skills and core competencies. The process in the applications might change with domains, but my core business analyst competencies across domains, I think that helped me in the retail side [Using business analyst skills]." (KX)

More specifically on individual soft skills, the previous work experience of business analysts could enhance their ‘ability to conceptualise and think creatively’ (DX). When business analysts constantly think of finding new approaches to their work, that could help them ‘articulate visions’, a soft skill particularly useful in requirements acquisition (DX). Verbal communication is an important soft skill needed by business analysts to convince the stakeholders about the requirements prescriptions (AX). Written communication is a skill which is important for business analysts to write good user stories that show clients’ requirements in a clear manner for easy understanding of developers (AX).

“A good analyst would be able to draw upon experiences which worked for him in the past. With my own past experience or a brand-new certificate, I proved that I am good at what I do but with a fresh pair of eyes, and maybe a mind that questions why are doing it that way [Being curious].” (DX)

“You require some critical key behaviour, listening [Listening skills] and trying to figure all of that and from that you get potentially a new way of approaching things, it is a bit of a dialogue and reconciling going on in your mind, and having those conversations to build up a fuller and accurate picture to understand the business and then interpret the requirements [Using analytical skills], drive some solutions.” (DX)

“When you talk to stakeholders, your people skills, convincing skills [Convincing skills] as business analyst come into the picture, irrespective of the domain.” (AX)

“With business analyst skills, you know how to write a particular user story [Documentation skills] that delivers what all the business stakeholders want, while it does not overburden the developers either.” (AX)

‘Understanding user needs and business outcome approach’ is a soft skill that comes handy when business analysts try to understand complex business scenarios (NX). An ‘investigative and inquisitive mind’ is a soft skill which is crucial for business analysts to get insights on the business processes (NX).

“You do know how to organise stuff in your domain, that’s the business analyst skill, like understanding complex things, understanding jumbled up puzzle sort of stuff, making sense out of complex scenarios [Problem solving skills] or it could be just numbers.” (NX)

“When you enter into a new domain you should have this new lens of curiosity and ask all those questions that give a lot of valuable insights if you are trying to enhance some processes [Being curious].” (NX)

Finally, when business analysts work on new or complex domains, they might require a different skillset and approach from the skills they used in previous projects in other domains or subdomains (DX).

“If there is a domain or subdomain that is complex, it requires a different approach, different skillset, and series of behaviours in order to approach that. You can’t rely on your prior learnings or previous subdomains, because there are so many other things that you might not have experienced, that you won’t know, that will be completely different, that you have to treat it as a new complex domain or subdomain.” (DX)

The construction of ‘role of soft skills of business analysts’ sub-theme with its codes is given in Figure 4.10.

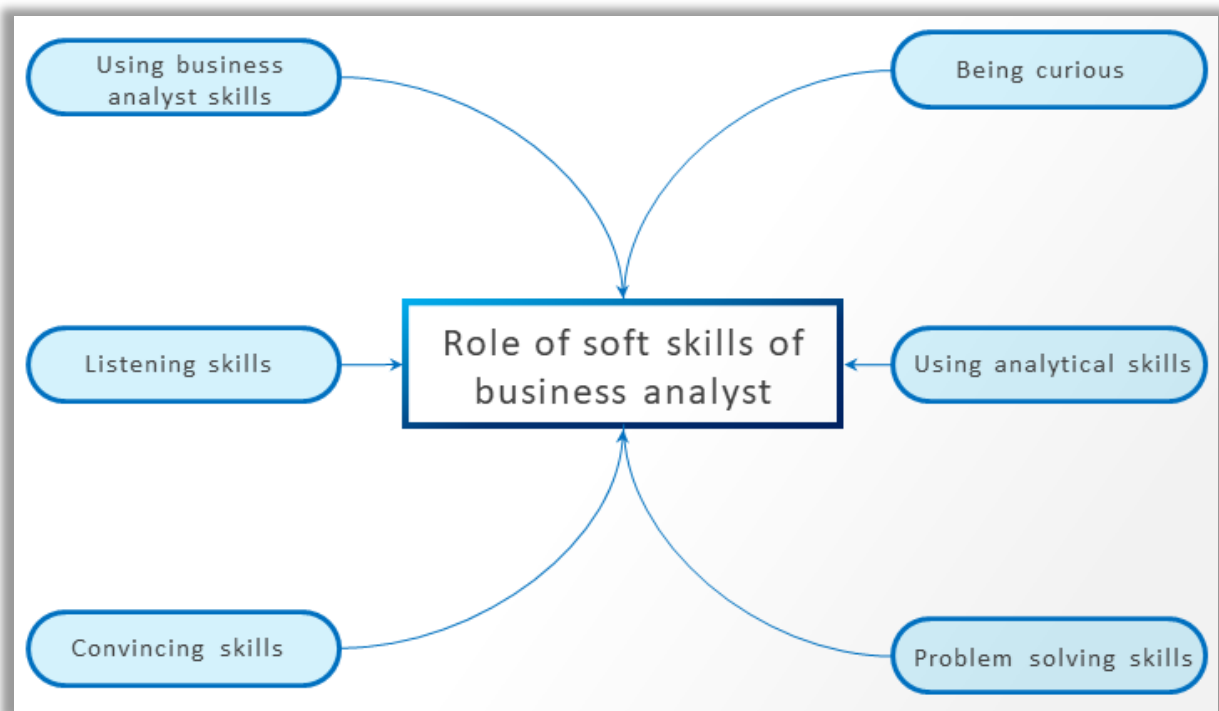


Figure 4.10: Construction of role of soft skills of business analyst sub-theme

4.6 Chapter conclusion

This chapter presented the findings including the construction of codes, sub-themes, and main themes. The findings are based on the participants' responses highlighting their experiences of working in new and/or multiple domains. The participants' perceptions on the role of domain knowledge and soft skills in acquiring client requirements and communication of requirements to the internal team members is included in the findings. The findings also incorporate the approaches followed by the participants in the ISD process and the constraints they faced. The findings led to identification of 55 codes which resulted in the formation of 10 sub-themes and four themes. The four main themes are: (a) business domain knowledge; (b) requirements acquisition; (c) communication of requirements; and (d) domain

knowledge vs soft skills. The ensuing chapter discusses the themes at a higher level of abstraction in relation to the extant literature.

Chapter 5 Discussion

5.1 Introduction

The literature review informed my ideas for research on the role of business domain knowledge of business analysts in requirements acquisition and communication of requirements. This chapter discusses the findings of my research under four themes (business domain knowledge, requirements acquisition, communication of requirements, and domain knowledge vs soft skills) in relation to the key concepts in extant literature. The concepts are that business analysts' domain knowledge is crucial to not only acquire client requirements and develop accurate requirements prescriptions, but also to effectively communicate the requirements to internal software teams and client stakeholders, and thus to ISD success.

5.2 Business domain knowledge

The participants had the perception that it is important to keep themselves abreast with business domain knowledge, including any new developments in the domain to avoid errors that could lead to critical ISD failures. The literature supports the participants' perception that lack of domain knowledge makes it difficult for business analysts to articulate their thoughts, making requirements acquisition error-prone, time-consuming, and expensive (Buchan et al., 2009). The participants also felt that familiarity with domain terminology helps them in understanding the problem and write precise user stories. This research finding is consistent with the extant literature (Bjørner, 2006; Bostrom, 1989; Hadar et al., 2012) that business analysts' familiarity with domain terminology helps them ask questions clearly to ensure acquisition of accurate requirements from clients. One finding that emerged was that some participants perceived some domains to be more complex and difficult to handle in the beginning than other domains. However, the literature does not support the idea of 'complex domains', possibly because every domain could have its own complexities for business analysts who lack experience in the domain.

The participants shared a common experience of self-learning to gain the required business domain knowledge due to their passion and need to learn, because their organisations did not have a knowledge transfer strategy with SMEs available to transfer their tacit knowledge to new business analysts. The literature affirms the need for top-level management of ISD organisations to facilitate knowledge transfer across ISD staff (Walz et al., 1993), the strategy also contributing to economic success of organisations (Campos & Sánchez, 2003). While the participants had to undergo training courses under their own arrangements, the literature reflects on the need for organisations to arrange for training of business analysts so that they become more effective in requirements acquisition (Hadar et al., 2012).

The participants were constrained by the fact that very few organisations had knowledge repositories with properly encoded knowledge available for their use. Moreover, in the few organisations which

maintained a repository, the available information was too fragmented to be of much use to understand the business processes involved. The need for organisations to maintain knowledge repositories for use by business analysts to enhance their business domain knowledge is amply demonstrated in the literature (Campos & Sánchez, 2003; Bharadwaj & Saxena, 2005; Desouza et al., 2006; Vitharana et al., 2012; Ryan & O'Connor, 2013; Ramona & Alexandra, 2019).

5.3 Requirements acquisition

The second theme derived from the participants' responses is 'requirements acquisition'. The participants averred on the importance of stakeholder engagement to understand the stakeholders' role and way of functioning in their companies. The participants had also the experience of business domain knowledge and communication skills helping them to establish rapport with their clients and gain trust. The rapport and trust helped business analysts in the requirements acquisition process during their ongoing as well as future projects when they worked with the same clients. The participants' view is in conformity with literature which brings out the importance of stakeholder engagement in the requirements acquisition process (Bjørner, 2006). The literature also shows that the stakeholders' trust in business analysts' domain knowledge facilitates a free discussion that enables acquisition of requirements in a precise and comprehensive manner (Hadar et al., 2012; Latef et al., 2018; Fannoun & Kerins, 2019).

The participants also stated that most organisations do not maintain documents for them to refer and better prepare for the requirements acquisition sessions. The literature supports the participants' perception that one main step that business analysts could take before the requirements acquisition process is to improve their domain knowledge by studying documents on the domain available in their organisations (Bjørner, 2006; Ganesh & Thangasamy, 2011; Tiwari et al., 2012).

The participants were aware that business analysts who lacked domain knowledge cannot properly discuss business scenarios with clients and would fail to understand and capture the requirements properly. The literature confirms the participants' perception that business analysts lacking domain knowledge neither can articulate their thoughts clearly during the requirements acquisition nor bring in rich ideas to enhance the effectiveness and quality of the process (Ranganathan & Sethi, 2002; Buchan et al., 2009; Ganesh & Thangasamy, 2011).

The participants avowed on the need for going with a well-structured questionnaire for requirements acquisition to elicit and document the requirements effectively and expeditiously. The literature reinforces this view that business analysts who meticulously note down the requirements acquisition proceedings are able to develop better requirements prescriptions documents (Carr, 2000; Bjørner, 2006).

The participants experienced difficulties in requirements acquisition while working in new domains. This difficulty is attributed in literature to the lack of training in requirements acquisition techniques (Pitts & Browne, 2007; Hadar et al., 2012) and the business analysts' insufficient knowledge of the new business domains that they work in (Vitharana et al., 2012).

5.4 Communication of requirements

The third theme developed from the participants' perceptions and experiences is communication of requirements. While some participants preferred to use the simple whiteboard to communicate the requirements to the developers, some others used tools like Microsoft Teams, and Visio type of tools. The participants asserted that both business domain knowledge and verbal communication skill are useful in communicating the requirements, for example, in answering developers' questions on the clients' needs, and in creating a shared understanding of requirements by clients and developers. The literature conforms to the participants' view on importance of domain knowledge in communication of requirements (Buchan et al., 2009), adding that verbal communication skill is important to avoid coordination breakdowns and lowered developer productivity (Damian, 2007).

The lack of business domain knowledge and unfamiliarity with domain terminology were constraints commonly perceived by the participants hindering their communication of requirements to developers. Their perception is consistent with the literature that highlights the importance of business analysts' domain knowledge to better understand the client's business before possible solutions are proposed to the developers (Friedrich & Poll, 2007).

5.5 Business domain knowledge vs soft skills

The fourth and final theme constructed from the participants' perceptions is the 'role of business domain knowledge vs soft skills' in requirements acquisition and communication of requirements. The participants' perception was that both business domain knowledge as well as soft skills are important in requirements acquisition and communication of requirements to the internal team members. The importance of business analysts' business domain knowledge in ISD has been amply displayed in the literature. The importance of soft skills, for example, creative thinking, verbal and written communication, negotiation, and ability to analyse and logically approach problem solving with an investigative and inquisitive mind is also supported in the literature (Richard & Marrone, 2014; Pitts & Browne, 2007).

5.6 Chapter conclusion

This chapter has discussed my research findings based on the participants' perceptions and how they relate to the extant literature and theoretical foundations of my research. The first theme 'business domain knowledge' dwelled on the role and importance of business domain knowledge to the business analysts in general. The second and third themes dealt more specifically with the role and impact of

business domain knowledge on the requirements acquisition and communication of requirements processes. The final theme added the dimension of business analysts' soft skills as another contributor to the ISD success. The next chapter will provide theoretical contribution and implications for practice of my research, limitations of the research, and opportunities for future research.

Chapter 6 Conclusion

This chapter initially presents the theoretical contribution of my study in providing answers to the research questions and the practical implications of the study. The limitations of the study and opportunities for future research are dealt with subsequently.

6.1 Theoretical contribution and practical implications of study

The findings of my study provide answers to the two research questions.

1. How does business domain knowledge of business analysts impact acquisition of client requirements?
2. How does business domain knowledge of business analysts impact communication of client requirements to multiple team members in ISD projects?

The participants were aware that their business domain knowledge had a positive impact in acquisition of client requirements and the knowledge helps them avoid errors that could lead to ISD failures. The participants' perception is supported by literature that business analysts' lack of domain knowledge makes the requirements acquisition process error-prone, time-consuming, and expensive (Bjørner, 2006; Buchan et al., 2009; Hadar et al., 2012). The perception of some participants that some domains are more complex and difficult to handle is however not supported by literature, possibly because every domain could have its own complexities.

The participants had to enhance their domain knowledge mainly through self-efforts as most ISD organisations did not have a knowledge transfer strategy for new business analysts to gain domain knowledge. The literature also reflects on the need for organisations to have a strategy to enhance domain knowledge of business analysts by arranging for their training, using SMEs and establishment of well-maintained knowledge repositories (Walz et al., 1993; Campos & Sánchez, 2003; Bharadwaj & Saxena, 2005; Desouza et al., 2006; Vitharana et al., 2012; Ryan & O'Connor, 2013; Ramona & Alexandra, 2019).

The participants expressed that domain knowledge helps them gain the clients' trust, which facilitates them to conduct the requirements acquisition process in a detailed manner contributing to ISD success. The participants' view is corroborated by literature that the clients' trust in business analysts' domain knowledge facilitates a free discussion that enables acquisition of requirements in a precise and comprehensive manner (Hadar et al., 2012; Latef et al., 2018; Fannoun & Kerins, 2019).

The participants were mindful that lack of domain knowledge affects their ability to discuss business scenarios and capturing requirements properly. The literature also confirms the participants' perception that business analysts' lack of domain knowledge seriously impacts their ability to articulate thoughts resulting in lowered effectiveness and quality of the requirements acquisition process (Ranganathan & Sethi, 2002; Buchan et al., 2009; Ganesh & Thangasamy, 2011).

The participants asserted that business domain knowledge and familiarity with domain terminology are vital for effective communication of requirements and create a shared understanding of requirements by clients and developers. The literature corroborates the view that lack of domain knowledge and unfamiliarity with domain terminology could adversely affect the business analysts' ability to effectively communicate the requirements to the developers (Friedrich & Poll, 2007; Buchan et al., 2009). Finally, the participants also highlighted the role of business analysts' soft skills in acquisition and communication of requirements, a view in consonance with literature (Richard & Marrone, 2014; Pitts & Browne, 2007).

The practical implication of the study for business analysts is that they should on their own gain sufficient business domain knowledge, through all means, for example, by self-learning or approaching subject matter experts (SMEs). The implication for ISD organisations is that they should support business analysts to gain domain knowledge through training courses, providing SMEs, and establishing well-maintained knowledge repositories.

6.2 Limitations of the study and opportunities for future research

A limitation of the study is that it is very country specific as the entire data was collected from participants from New Zealand. The issue with only from New Zealand being collected in the study is that these data are very country-specific to business processes, corporate policies, training programs, and involve mainly local customers. As a result, the global perspective on my research topic and research questions is not fathomed out in the study missing out information on business processes, policies and practices prevailing in other countries. It would therefore be useful if future research could include participants from different countries to get a global perspective of my research topic, i.e., the role of business analysts' business domain knowledge in the ISD process.

Another limitation of the study is that it is restricted to the business analysts' business domain knowledge. Future research could expand on other knowledge areas of business analysts, for example, enterprise analysis, requirements analysis, or solution assessment. The focus in enterprise analysis could be on identifying and defining why a change in organisational systems is required. Research on requirement analysis could focus on the various aspects in requirements analysis and implementation. Solution assessment research could help in assessment of the solutions proposed to appropriately meet the client requirements. The findings of such research are expected to help organisations to strategically prioritise their business analyst training to the most relevant knowledge areas in ISD.

References

- Ahsan, M., Motla, Y. H., Anwar, A., & Azeem, M. W. (2014). Knowledge management model for support of requirement engineering. *2014 International Conference on Emerging Technologies (ICET)*. <https://doi.org/10.1109/ICET.2014.7021008>
- Alami, A., Wong, B., & McBride, T. (2014). Relationship issues in global software development enterprises. *Journal of Global Information Technology Management*, 11(1), 49-68. <https://doi.org/10.1080/1097198X.2008.10856461>
- Al-Rawas, A., & Easterbrook, S. (1996). Communication problems in requirements engineering: A field study. *Proceedings of the First Westminster Conference on Professional Awareness in Software Engineering*, Royal Society.
- Alshamrani, A., Bahattab, A., & Fulton, I. A. (2015). A comparison between three SDLC Models: Waterfall model, spiral model, and incremental/iterative model. *International Journal of Computer Science Issues*, 12(1), 106-111. <https://bit.ly/3qs8y41>
- Aranda, A., Dieste, O., & Juristo, N. (2012). In search of requirements analyst characteristics that influence requirements elicitation effectiveness: a quasi-experiment. *First Workshop on Managing the Influence of People and Team Factors in Software Engineering (INTEAMSE 2012)*.
- Avgousti, K. (2013). Research philosophy, methodology, quantitative and qualitative methods. *The Cyprus Journal of Sciences*, 11, 33-43. <https://bit.ly/37wKN2l>
- Annaiahshetty, K., & Prasad, N. (2013). Expert system for multiple domain experts knowledge acquisition in software design and development. *2013 UKSim 15th International Conference on Computer Modelling and Simulation*. <https://doi.org/10.1109/UKSim.2013.124>
- Awal, A., Mishra, A., Usman, G. M., & AbdulG, A. (2018). Ontology development for the domain of software requirement elicitation technique. *International Journal of Engineering Research & Technology (IJERT)*, 7(4). <https://doi.org/10.17577/IJERTV7IS040237>
- Bakewell, O. (2003). *Sharpening the development process: a practical guide to monitoring and evaluation*. INTRAC.
- Balaji, S., & Murugaiyan, M. S. (2012). Waterfall vs V-model vs agile: A comparative study on SDLC. *International journal of Information Technology and Business Management*, 2(1): 26-30. <https://bit.ly/2Ic2awL>
- Bennatan, E. M. (1995). *Software project management: A practitioner's approach* (2nd ed.). UK: McGraw-Hill.
- Bharadwaj, S. S., & Saxena, K. B. C. (2005). Knowledge management in global software teams. *Vikalpa*, 30(4). <https://doi.org/10.1177/0256090920050406>
- Bjørner, D. (2006). *Software engineering 3: Domains, requirements, and software design*. Springer Science & Business Media. <https://doi.org/10.1007/3-540-33653-2>
- Bostrom, R. P. (1989). Successful application of communication techniques to improve the systems development process. *Information & Management*, 16(5), 279-295. [https://doi.org/10.1016/0378-7206\(89\)90005-0](https://doi.org/10.1016/0378-7206(89)90005-0)
- Buchan, J., Ekadharmawan, C. H., & MacDonell, S. G. (2009). Insights into domain knowledge sharing in software development practice in SMEs. *2009 16th Asia-Pacific Software Engineering Conference*. <https://doi.org/10.1109/APSEC.2009.47>

- Byrd, T. A., Cossick, K. L., & Zmud, R. W. (1992). A synthesis of research on requirements analysis and knowledge acquisition techniques. *MIS Quarterly*, 16(1), 117-138.
- Campos, E. B., & Sánchez, M. P. S. (2003). Knowledge management in the emerging strategic business process: information, complexity and imagination. *Journal of knowledge management*, 7(2). <https://doi.org/10.1108/13673270310477252>
- Carr, J. J. (2000). Requirements engineering and management: the key to designing quality complex systems. *The TQM Magazine*, 12(6), 400-407. <https://doi.org/10.1108/09544780010351760>
- Clarke, V., Braun, V., & Hayfield, N. (2006). Thematic Analysis. In *Qualitative Research in Psychology* (pp. 77-101).
- Curtis, B., Krasner, H., & Iscoe, N. (1988). A field study of the software design process for large systems. *Communications of the ACM*, 31(11). <https://doi.org/10.1145/50087.50089>
- Damian, D. (2007). Stakeholders in global requirements engineering: Lessons learned from practice. *IEEE SOFTWARE*, 24(2), 21-27. <https://doi.org/10.1109/MS.2007.55>
- Davey, B., & Parker, K. R. (2015). Requirements elicitation problems: A literature analysis. *Issues in Informing Science and Information Technology*, 12, 71-82. <https://doi.org/10.28945/2211>
- Desouza, K. C., Awazu, Y., & Baloh, P. (2006). Managing knowledge in global software development efforts: Issues and practices. *IEEE SOFTWARE*, 23(5), 30-37. <https://doi.org/10.1109/MS.2006.135>
- Drake, J. M., Xie, W. W., Tsai, W. T., & Zualkernan, I. A. (1993). Approach and case study of requirement analysis where end users take an active role. *Proceedings of 1993 15th International Conference on Software Engineering*. <https://doi.org/10.1109/ICSE.1993.346046>
- Drury, B., Fernandes, R., Moura, M.-F., & Lopes, A. d. A. (2019). A survey of semantic web technology for agriculture. *Information Processing in Agriculture*, 6, 487-501. <https://doi.org/10.1016/j.inpa.2019.02.001>
- Evans, C. (2017). Analysing semi-structured interviews using thematic analysis: Exploring voluntary civic participation among adults. *Sage research methods datasets*. <https://doi.org/10.4135/9781526439284>
- Fannoun, S., & Kerins, J. (2019). Towards organisational learning enhancement: assessing software engineering practice. *The Learning Organization*, 26(1), 44-59. <https://doi.org/10.1108/TLO-09-2018-0149>
- Fiol, C., & Lyles, M. (1985). Organizational learning. *Academy of Management Review*, 10, 803-813. <https://doi.org/10.2307/258048>
- Fitzpatrick, R. (1996). Software quality: definitions and strategic issues. *School of Computing Reports Dublin Institute of Technology*.
- Friedrich, W. R., & Poll, J. A. v. d. (2007). Towards a methodology to elicit tacit domain knowledge from users. *Interdisciplinary Journal of Information, Knowledge, and Management*, 2.
- Ganesh, N., & Thangasamy, S. (2011). Issues identified in the software process due to barriers found during eliciting requirements on agile software projects: Insights from India. *International Journal of Computer Applications*, 16(5), 7-12. <https://doi.org/10.5120/2011-2713>
- Hadar, I., Soffer, P., & Kenzi, K. (2012). The role of domain knowledge in requirements elicitation via interviews: an exploratory study. *Requirements Eng.* <https://doi.org/10.1007/s00766-012-0163-2>

- Hansen, M. T., Nohria, N., & Tierney, T. (1999). What's your strategy for managing knowledge? *Harvard Business Review*. <https://hbr.org/1999/03/whats-your-strategy-for-managing-knowledge>
- Jiang, J., Klein, G., Beck, P., & Wang, E. T. G. (2007). Lack of skill risks to organizational technology learning and software project performance. *Information Resources Management Journal*, 20(3), 32-45. <https://doi.org/10.4018/irmj.2007070103>
- Kang, K., Hahn, J., & De, P. (2017). Learning Effects of Domain, Technology, and Customer Knowledge in Information Systems Development: An Empirical Study. *Information Systems Research*, 28(4), 797-811. <https://doi.org/10.1287/isre.2017.0713>
- Khatri, V., & Vessey, I. (2016). Understanding the role of is and application domain knowledge on conceptual schema problem solving: A verbal protocol study. *Journal of the Association for Information Systems*, 17(12), 759-803. <https://doi.org/10.17705/1jais.00445>
- Kroha, P., Janetzko, R., & Labra, J. E. (2009). Ontologies in checking for inconsistency of requirements specification. *2009 Third International Conference on Advances in Semantic Processing*. <https://doi.org/10.1109/SEMAPRO.2009.11>
- Lam, A. (2000). Tacit knowledge, organizational learning and societal institutions: An integrated framework. *Organization Studies*, 21(3), 487-513. <https://doi.org/10.1177/0170840600213001>
- Latef, M., Aslam, T., & Sehar, P. (2018). Impact of domain knowledge in phase of requirement engineering. *International Journal of Advanced Research and Development*, 3(6), 54-57.
- Lefkowitz, L. S., & Lesser, V. R. (1988). Knowledge acquisition as knowledge assimilation. *Int. J. Man-Machine Studies*, 29(2), 215-226. [https://doi.org/10.1016/S0020-7373\(88\)80047-6](https://doi.org/10.1016/S0020-7373(88)80047-6)
- Losavio, F., Chirinos, L., Lévy, N., & Ramdane-Cherif, A. (2003). Quality characteristics for software architecture. *JOURNAL OF OBJECT TECHNOLOGY*, 2(2), 133-150. <https://doi.org/10.5381/jot.2003.2.2.a2>
- Meher, J. R., & Mishra, R. K. (2019). Assessing the influence of knowledge management practices on organizational performance An ISM approach. *Journal of Information and Knowledge Management Systems*, 49(3). <https://doi.org/10.1108/VJIKMS-04-2019-0050>
- Mollá, R., Santamarina-Campos, V., Abad, F., & Tipantuña, G. (2018). Storyboarding as a Means of Requirements Elicitation and User Interface Design: An Application to the Drones' Industry. In V. Santamarina-Campos & M. Segarra-Oña (Eds.), *Drones and the Creative Industry* (pp. 83-97). Springer, Cham. https://doi.org/10.1007/978-3-319-95261-1_6
- Neuman, W. L. (2014). *Social research methods: Qualitative and Quantitative approaches* (7th ed.). Pearson education Limited.
- Nidhraa, S., Yanamadala, M., Afzal, W., & Torkara, R. (2013). Knowledge transfer challenges and mitigation strategies in global software development—A systematic literature review and industrial validation. *International Journal of Information Management*(33), 333-355. <https://doi.org/10.1016/j.ijinfomgt.2012.11.004>
- Pitts, M. G., & Browne, G. J. (2007). Improving requirements elicitation: an empirical investigation of procedural prompts. *Info Systems Journal*, 17(1), 89-110. <https://doi.org/10.1111/j.1365-2575.2006.00240.x>
- Pohl, K. (2010). *Requirements engineering: fundamentals, principles, and techniques*. Springer
- Prokesch, S. (1997). Unleashing the power of learning: An interview with British petroleum's John Browne. *Harvard Business Review*, 75(5), 146-163. <https://hbr.org/1997/09/unleashing-the-power-of-learning-an-interview-with-british-petroleum-john-browne>

- Ramona, T., & Alexandra, B. (2019). Knowledge Retention within Small and Mediumsized Enterprises. *Studies in Business and Economics*, 14(3), 231-238. <https://doi.org/10.2478/sbe-2019-0056>
- Ranganathan, C., & Sethi, V. (2002). Rationality in strategic information technology decisions: The impact of shared domain knowledge and IT unit structure. *Decision Sciences*, 33(1), 59-86. <https://doi.org/10.1111/j.1540-5915.2002.tb01636.x>
- Richards, D., & Marrone, M. (2014) Identifying the education needs of the business analyst: An Australian study. *Australasian Journal of Information Systems*, 18(2) 165-186. <https://doi.org/10.3127/ajis.v18i2.803>
- Ruparelia, N. B. (2010). Software development lifecycle models. *ACM SIGSOFT Software Engineering Notes*, 35(3), 8-13. <https://doi.org/10.1145/1764810.1764814>
- Ryan, S., & O'Connor, R. V. (2013). Acquiring and sharing tacit knowledge in software development teams: An empirical study. *Information and Software Technology*, 55(9), 1614-1624. <https://doi.org/10.1016/j.infsof.2013.02.013>
- Salado, A., & Nilchiani, R. (2014). The concept of order of conflict in requirements engineering. *IEEE systems journal*, 10(1), 25-35. <https://doi.org/10.1109/JSYST.2014.2315597>
- Schenk, K. D., Vitalari, N. P., & Davis, K. S. (1998). Differences between novice and expert systems analysts: What do we know and what do we do? *Journal of Management Information Systems*, 15(1), 9-50. <https://doi.org/10.1080/07421222.1998.11518195>
- Sedera, D., & Gable, G. G. (2010). Knowledge management competence for enterprise system success. *Journal of Strategic Information Systems*, 296-306. <https://doi.org/10.1016/j.jsis.2010.10.001>
- Shaft, T. M., & Vessey, I. (1998). The relevance of application domain knowledge: Characterizing the computer program comprehension process. *Journal of Management Information Systems*, 15(1), 51-78. <https://doi.org/10.1080/07421222.1998.11518196>
- Spender, J. C. (1996). Making knowledge the basis of a dynamic theory of the firm. *Strategic Management Journal*, 17, Winter Special Issue, 11-25. <https://doi.org/10.1002/smj.4250171106>
- Suter, W. N. (2012). Qualitative data, analysis, and design. In *Introduction to Educational Research: A Critical Thinking Approach* (2nd ed.). <https://doi.org/10.4135/9781483384443.n12>
- Thanh, N. C., & Thanh, T. L. (2015). The interconnection between interpretivist paradigm and qualitative methods in education. *American Journal of Educational Science*, 1(2), 24-27. <https://bit.ly/3gignVC>
- Tiwana, A. (2003). Knowledge partitioning in outsourced software development: A field study. *International Conference on Information Systems (ICIS)*.
- Tiwana, A. (2012). Novelty-knowledge alignment: A theory of design convergence in systems development. *Journal of Management Information Systems*, 29(1), 15-51. <https://doi.org/10.2753/MIS0742-1222290101>
- Tiwari, S., Rathore, S. S., & Gupta, A. (2012). Selecting requirement elicitation techniques for software projects. 2012 CSI Sixth International Conference on Software Engineering (CONSEG). <https://doi.org/10.1109/CONSEG.2012.6349486>
- Vitharana, P., Jain, H., & Zahedi, F. M. (2012). A knowledge based component/service repository to enhance analysts' domain knowledge for requirements analysis. *Information & Management*, 49(1), 24-35. <https://doi.org/10.1016/j.im.2011.12.004>
- Wahyuni, D. (2012). The Research Design Maze: Understanding Paradigms, Cases, Methods and Methodologies. *Journal of Applied Management Accounting Research*, 10(1), 69-80.

- Walz, D. B., Elam, J., & Curtis, B. (1993). Inside a software design team: Knowledge acquisition, sharing, and integration. *Communications of the ACM*, 36(10).
- Yin, R. K. (2016). Qualitative research from start to finish (2nd ed.). New York: The Guilford Press.
<https://doi.org/10.1111/fcsr.12144>

Appendix A: Invitation letter sent to potential participants (LinkedIn connections)

Dear xxxxx,

Hope you are doing well. I am conducting a research as part of my Master of Business degree at the Auckland University of Technology (AUT). I am looking for participants to hear about the experiences as a business analyst and how business domain knowledge impacts them in acquiring and communicating client requirements in information systems development projects.

If you are interested in participating in an hour-long interview with me, please email me at znh0775@aut.ac.nz or send me a direct message on <https://www.linkedin.com/in/aishvaryagunasekar/>. The interview will be through an online meeting platform such as Zoom or Skype or if possible, face-to-face at a public place such as coffee shop or at AUT at a time and date convenient to you. The study has been approved by Auckland University of Technology Ethics Committee (20/217).

Upon receiving your communication, I will send you additional information along with a consent form for you to make your final decision if you want to participate in the research.

Best regards,

Aishvarya Gunasekar

Appendix B: Interview guide



Indicative Questions for the interview

1. Background information of participants.

- How many years of experience do you have in business analysis?
a) Less than 2 years ☐ b) 2 – 5 years ☐ c) more than 5 years ☐
- How many domains have you worked in?
a) 2 ☐ b) 3 ☐ c) ≥ 4 ☐
What are those domains?
- Do you use any software tools for requirement elicitation? Yes ☐ No ☐
What are those software tools?

2. Describe:

- Your responsibilities in current job as business analyst
- Your activities in a typical day

3. What do you think about the impact of domain knowledge on your day-to-day activities as a business analyst?

4. How would you describe your transition from one domain to the other? Learnings and challenges.

5. Which is more challenging with insufficient domain knowledge: client requirement acquisition or requirement communication to other team members? Why?

6. How do you develop your domain knowledge? What is the organisational support for that?

7. Are there any domains which are more complex than the others? Yes ☐ No ☐

8. Are there behaviours, attitudes, and practices that can block understanding and sharing client requirements with other team members? Yes ☐ No ☐ What are such behaviours, attitudes and practices and how do you manage them?

9. Beside domain knowledge, what other knowledge areas have challenged you? For example, technical knowledge, project management methodology (waterfall, agile), business analysis techniques and any other.

Appendix C: Ethics approval



Auckland University of Technology Ethics Committee (AUTEC)

Auckland University of Technology
D-88, Private Bag 92006, Auckland 1142, NZ
T: +64 9 921 9999 ext. 8316
E: ethics@aut.ac.nz
www.aut.ac.nz/researchethics

2 September 2020

Maduka Subasinghage
Faculty of Business Economics and Law

Dear Maduka

Re Ethics Application: **20/217 Exploring the role of business domain knowledge of business analysts in acquisition and communication of client requirements in Information Systems development (ISD) projects.**

Thank you for providing evidence as requested, which satisfies the points raised by the Auckland University of Technology Ethics Committee (AUTEC).

Your ethics application has been approved for three years until 1 September 2023.

Non-Standard Conditions of Approval

1. Please ensure that post-analysis data will be stored on an AUT network drive with restricted folder permissions.

Non-standard conditions must be completed before commencing your study. Non-standard conditions do not need to be submitted to or reviewed by AUTEC before commencing your study.

Standard Conditions of Approval

1. The research is to be undertaken in accordance with the [Auckland University of Technology Code of Conduct for Research](#) and as approved by AUTEC in this application.
2. A progress report is due annually on the anniversary of the approval date, using the EA2 form.
3. A final report is due at the expiration of the approval period, or, upon completion of project, using the EA3 form.
4. Any amendments to the project must be approved by AUTEC prior to being implemented. Amendments can be requested using the EA2 form.
5. Any serious or unexpected adverse events must be reported to AUTEC Secretariat as a matter of priority.
6. Any unforeseen events that might affect continued ethical acceptability of the project should also be reported to the AUTEC Secretariat as a matter of priority.
7. It is your responsibility to ensure that the spelling and grammar of documents being provided to participants or external organisations is of a high standard and that all the dates on the documents are updated.

AUTEC grants ethical approval only. You are responsible for obtaining management approval for access for your research from any institution or organisation at which your research is being conducted and you need to meet all ethical, legal, public health, and locality obligations or requirements for the jurisdictions in which the research is being undertaken.

Please quote the application number and title on all future correspondence related to this project.

For any enquiries please contact ethics@aut.ac.nz. The forms mentioned above are available online through <http://www.aut.ac.nz/research/researchethics>

(This is a computer-generated letter for which no signature is required)

The AUTEC Secretariat
Auckland University of Technology Ethics Committee

Cc: znh0775@aut.ac.nz; Antonio Diaz Andrade

Appendix D: Participant Information Sheet



Participant Information Sheet

Date Information Sheet Produced:

14 September 2020

Project Title

Exploring the role of business domain knowledge of business analysts in acquisition and communication of client requirements in Information Systems development (ISD) projects.

An Invitation

My name is Aishvarya Gunasekar and I invite you to participate in my research. This research is conducted as part of my Master of Business degree at the Auckland University of Technology (AUT). I would highly appreciate your participation in this study. The interview will take around 1 hour. The interview will be conducted via video-conferencing platform such as Zoom or Skype or if possible, face-to-face in a public place such as coffee shop or at AUT on a date and time of your convenience. I am looking forward to learning about your experiences.

What is the purpose of this research?

The purpose of this research is to understand how business domain knowledge impacts acquiring and communicating client requirements in information systems development projects. The findings of this research project will be published in my dissertation, academic and practitioner journals. However, by default your name will not be disclosed. All identifiable information will be disguised using pseudonyms so that nobody can identify you.

How was I identified and why am I being invited to participate in this research?

You were identified as a potential participant because you are a business analyst with more than 6 months' work experience and part of the researcher's network on LinkedIn or other social media. You are not a colleague or ex-colleague of the primary researcher. You are being invited to be a participant because your participation would be beneficial to this research.

How do I agree to participate in this research?

You will agree to participate in this research by sending a signed copy of the enclosed consent form to the primary researcher at znh0775@aut.ac.nz. Notes will be taken during the interviews and the interview will also be audio-taped and transcribed. Your participation in this research is voluntary (it is your choice) and whether or not you choose to participate will neither advantage nor disadvantage you in any form. You will be able to withdraw from the study at any time. If you choose to withdraw from the study, then you will be offered the

choice between having any data that is identifiable as belonging to you removed or allowing it to continue to be used anonymously. However, once the findings have been produced, removal of your data may not be possible.

What will happen in this research?

During the interview, which will be approximately one hour in duration and it will be audio-recorded and transcribed. The interviewer (Aishvarya Gunasekar) will ask you questions about (a) how many domains you have worked in, (b) if you use any software tools for requirement elicitation, (c) if you think domain knowledge is critical for business analyst and why, (d) what are your learnings and challenges in transition from one domain to the other, (e) are there behaviours, attitudes, practices blocking learning and sharing client requirements with other team members and how do you manage them, and (f) besides domain knowledge, what other knowledge areas have challenged you, for example, technical knowledge, project management methodology or business analysis techniques.

What are the discomforts and risks?

The interview questions will not lead to personal discomforts and embarrassment. The purpose of the interview is to collect information on your professional knowledge and it will not in any way pose a risk to you.

How will these discomforts and risks be alleviated?

You are not required to answer all questions and you can withdraw from the interview at any time. All information provided by you will be kept confidential.

What are the benefits?

This is a great opportunity for you to reflect on the role of domain knowledge in acquiring and communicating clients' requirements. Oftentimes you might be occupied with your work schedule and do not have time to reflect on how domain knowledge can have a role to play in effectively acquiring client requirement and comprehensively communicating it to developers and the other team members. The interview should give you sufficient time to absorb the questions and to critically reflect on various dimensions of the issues involved in collaboration with the interviewer.

Your participation will benefit the researcher with valuable insights to the role of domain knowledge in information systems development projects in perspective of business analyst. This research will also help the researcher in acquiring a Master of Business degree from AUT. Your participation will help to develop recommendations for individuals and companies about how to manage domain knowledge effectively to improve functioning in companies.

How will my privacy be protected?

Please note that all the information you provide are used for research purposes only. Your privacy will be protected by use of pseudonymised name (changed to a fictive name). Complete confidentiality is assured by disguising your names and your organisation's names in dissertation/publications. However, you could choose to be identifiable in the publications. If you have any questions during the interview, please feel free to ask anytime.

The information provided by you will be shared by the primary researcher only with supervisors involved in this research.

What are the costs of participating in this research?

There is no cost of participating in this research, and just one hour of your valuable time.

What opportunity do I have to consider this invitation?

You will be sent an invitation email and would be given more than one week to decide if you want to participate in the research. Once you confirm your participation, an interview will be scheduled at a place, time, and date of your convenience. The interview will be through an online meeting platform such as Zoom or Skype or if possible, face-to-face at a public place such as coffee shop or at AUT.

Will I receive feedback on the results of this research?

Yes. You will be sent the final results of this research from the email id znh0775@aut.ac.nz.

What do I do if I have concerns about this research?

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, Dr Maduka Subasinghage, maduka.subasinghage@aut.ac.nz, (+64)921 9999 ext. 5048. Concerns regarding the conduct of the research should be notified to the Executive Secretary of AUTECH, ethics@aut.ac.nz, (+649) 921 9999 ext. 6038.

Whom do I contact for further information about this research?

Please keep this Information Sheet and a copy of the Consent Form for your future reference. You are also able to contact the research team as follows:

Researcher Contact Details:

Aishvarya Gunasekar, znh0775@aut.ac.nz, (+64)22 77 2661

Project Supervisor Contact Details:

Dr Maduka Subasinghage, maduka.subasinghage@aut.ac.nz, (+64)921 9999 ext. 5048

Approved by the Auckland University of Technology Ethics Committee on 02/09/2020, AUTECH Reference number 20/217.

Appendix E: Consent Form



Consent Form

Project title: Exploring the role of business domain knowledge of business analysts in acquisition and communication of client requirements in Information Systems development (ISD) projects.

Project Supervisor: Dr Maduka Subasinghage

Researcher: Aishvarya Gunasekar

- ☐ I have read and understood the information provided about this research project in the Information Sheet dated 14 September 2020.
- ☐ I have had an opportunity to ask questions and to have them answered.
- ☐ I understand that notes will be taken during the interviews and the interview will also be audio-taped and transcribed.
- ☐ I understand that taking part in this study is voluntary (my choice) and that I may withdraw from the study at any time without being disadvantaged in any way.
- ☐ I understand that if I withdraw from the study then I will be offered the choice between having any data that is identifiable as belonging to me removed or allowing it to continue to be used. However, once the findings have been produced, removal of my data may not be possible.
- ☐ I understand that by default, my name will not be disclosed. All identifiable information will be disguised using pseudonyms so that nobody can identify me.
- ☐ I agree to be identified in dissertation/papers (please tick one): Yes ☐ No ☐
- ☐ I agree to take part in this research.
- ☐ I wish to receive a summary of the research findings (please tick one): Yes ☐ No ☐

Participant's signature:

.....

Participant's name:

.....

Participant's Contact Details (if appropriate):

.....
.....
.....
.....

Date:

*Approved by the Auckland University of Technology Ethics Committee on 02/09/2020, AUTECH
Reference number 20/217*

Note: The Participant should retain a copy of this form.

Appendix F: Generation of codes from selected participant quotes by participant

Participant AX: Generation of codes from selected quotes

Participant quotes	Codes
If you have good business analyst skills, domain knowledge is secondary, you can survive in any domain.	Using business analyst skills
The learning curve get shortened if you have previous work experience in that domain.	Knowledge from previous experience
You may get surprised when you talk to the client, they may throw some terms at you.	Understanding domain terminologies
There can be someone within the organisation who can give knowledge transfer who would have worked on similar projects before you go to the client. If there is someone who has worked on similar projects or currently working in the project prior to you, they give knowledge transfer before you actually go and meet the client.	Knowledge transfer from other employees
I do my research on google about the project and the domain that surrounds the project.	Self-learning.
We have to continuously learn, so if it is healthcare, we need to keep reading articles, or may even subscribe to articles to understand what is new happening in the domain.	Keeping up to date
While talking to the stakeholders, you need to understand the business process and how the solution has to work.	Understanding the client's business process
When you start getting the requirements, and at this point, you are not judgmental at all, you take in whatever the clients are saying and keep jotting them down. And once this is done, you start writing your requirements in a manner that all the business stakeholders can understand.	Documenting the requirements
I ensure that while writing user stories that they are well understood by the clients as well as by the developers.	Writing user stories
Though the business stakeholders normally talk also to the development or testing team, I, as a business analyst, make sure that they both are quite in line and understand each other.	Balancing

When you talk to stakeholders, your people skills, convincing skills as business analyst come into the picture, irrespective of the domain.	Convincing skills
With business analyst skills, you know how to write a particular user story that delivers what all the business stakeholders want, while it does not overburden the developers either.	Documentation skills
Convincing the business stakeholders and technical team can be an issue sometimes.	Convincing the team
Developers or architects will push back on requirements saying that don't solutionise or you write your user stories that give solution.	Solutionising the requirements
It is good to have domain knowledge if the project is complex for example, good to know terms like what negative interest rate in financial domain is.	Complexity in project
One project I was offered was because the person previously working on it didn't have the domain knowledge and they were struggling to deliver what the client required, and the client was not too happy.	Inadequate domain knowledge

Participant CX: Generation of codes from selected quotes

Participant quotes	Codes
We have to be very sharp in documentation skills, observe the information, and document all that stuff, even if it is for our own understanding.	Documenting the requirements
Understanding what the patient journey like, basic background knowledge helps a lot because people in my healthcare company who haven't done it before, it is a big learning curve for them.	Inadequate domain knowledge

Participant DX: Generation of codes from selected quotes

Participant quotes	Codes
When you are working in banking and insurance, they are complex domains. There could also be some subdomains that are more complex than the others.	Complexity in sub-domains
Once, there were three mainland Chinese developers, and it can be a challenge. But if I draw a picture on the board, they get it, they can understand the picture. Simplifying things and getting back to basics is very worthwhile exercise.	Using visual representation
Sometimes, you need to reflect on the learnings here, why we are struggling with this. Sometimes, the answer is obvious and why you would share that with the team. Constant communication is really important.	Following up with team
One of the issues in communicating or collaborating with the team could be personal issues.	Dealing with personal issues
You may have tacit knowledge, but you cannot communicate that well unless you have good domain experience.	Using domain experience
A good analyst would be able to draw upon experiences which worked for him in the past. With my own past experience or a brand-new certificate, I proved that I am good at what I do but with a fresh pair of eyes, and maybe a mind that questions why are doing it that way.	Being curious
You require some critical key behaviour, listening and trying to figure all of that and from that you get potentially a new way of approaching things.	Listening skills
It is a bit of a dialogue and reconciling going on in your mind and having those conversations to build up a fuller and accurate picture to understand the business and then interpret the requirements, drive some solutions.	Using analytical skills

Participant EX: Generation of codes from selected quotes

Participant quotes	Codes
I think most business analysts who have knowledge of different domains can just build the pieces together, when in a new domain.	Knowledge of different domains
I would definitely say that communication skills are important, getting something from customers on what they really want is fine, but giving someone work, the technical people really want to push back on it.	Using verbal communication skills
When it comes to dealing with technical team you need to know what each domain terminology means, but it is kind of complex.	Explaining the requirements
We have like a storage team, data protection and stuff like that in the company, but they use acronyms where it means something to one team and same acronym may mean something else to the other team, and that's confusing but they also use a lot of technical knowledge and terms.	Understanding domain terminologies

Participant IX: Generation of codes from selected quotes

Participant quotes	Codes
I have worked only in insurance domain, but initially there was a hiccup because insurance domain is very complex.	Complexity in domain
You talk to a lot of people, subject matter experts. basically, they know the product in and out.	Acquiring knowledge from domain experts
You also learn during your job.	On-the-job training
I have worked in organisations where they had fantastic learning material with them, so even if you are new to insurance domain or to the product, it was not difficult, you can ask and get the material and go through them.	Learning from documents
Slowly, the learning curve comes, what I learnt from team to team differed, but at least with the teams I have worked, I have always improved on my processes.	Knowledge from previous experience
I think you can still sail the boat and learn a lot of domain knowledge along the way and understand their business when you interact with the clients, doing the workshops.	Conducting workshops
Waterfall has long phases and a business analyst who has no domain knowledge will get more time to understand the domain, requirements and then write the requirements.	Using waterfall methodology
You have to communicate with your developers about what you have agreed upon with the business after getting the requirements and sign off done is being implemented that way and then test it.	Giving clarity
When the requirement elicitation phase starts, that is when you need a person who has good domain knowledge, if not very great. Obviously, a business analyst who has no domain knowledge will need more time to understand and write down the requirements.	Transitioning faster

Participant KX: Generation of codes from selected quotes

Participant quotes	Codes
I know it gets very complex in the pricing and actuarial side of work because when you calculate the mortality rates, the factors go into the calculation are complex.	Complexity in domain
Domain learning depends more on research rather than having something readily available for you.	Self-learning
Research on domain could be what you read up, exploring google, or talking to people or friends across different companies in the same domain. That is what I did in my initial days in insurance and banking, to gather knowledge, and bridge the gaps wherever there was a need.	Self-learning
I feel it is easier to access if they have a proper process of document maintenance, a document repository. There is a process and a separate team to take care of your entire document and training needs and that is more of an organised structure.	Learning from documents
It is important to have a subject matter expert or domain expert throughout the project because the business analyst, when switching domains might not always have domain knowledge.	Acquiring knowledge from domain experts
When dealing with stakeholders, you think in the long-term, because it is important to have your stakeholders accompany you throughout the entire project. Also, these are some stakeholders you may need to go back when you do future projects.	Building rapport
It is important to timely inform your stakeholders about all changes that are being made and their impacts. Typically, we speak about a stakeholder engagement plan which tells about who should be informed, who is accountable, and what are the risks.	Keeping the client updated
If you can't get time, that has been challenging...	Challenging due to insufficient time
In requirements acquisition, ideas convert into needs, needs convert into requirements, and from the requirements we do a feasibility analysis and then you start communicating the right things to the developer.	Giving clarity
I did have a challenge while moving from insurance and banking to retail, but what worked for me was being able to use my business analysis skills and core competencies.	Using business analyst skills

Participant KY: Generation of codes from selected quotes

Participant quotes	Codes
As part of training, in the initial days, the business analysts are included as part of customer calls so that they can understand what is happening, what kind of questions customer ask, what are the problem areas and how other business analysts are responding to those queries, and how requirements are captured.	On-the-job training
You just cannot go for getting the requirements from the customer, even the customer will expect some kind of information from you, for example, there was this customer who was facing some issues with the merit matrix configuration. You are also giving some value to the customers by sharing your ideas and thoughts.	Sharing ideas
Without domain knowledge, yes, it is not easy to go and talk to the customers, especially discussing the business scenarios. They can always learn it in a few weeks and start interacting with the customers well.	Using business scenarios
You apply domain knowledge more when you are doing requirements analysis, there could be multiple scenarios, that is when you do in-depth review of what clients want. You are doing analysis keeping both product knowledge and domain knowledge in your head.	Analysing client requirements
There will be questions by the development team when I discuss the requirements. They want to know what kind of questions the customers asked, what are the problem areas, how I responded to the customers' queries, and how requirements were captured.	Giving clarity
The initial challenge was to understand what the business need is, and how will application works.	Understanding the client's business process

Participant NX: Generation of codes from selected quotes

Participant quotes	Codes
I think one month is a good enough time to understand a project, there could be your own research, document analysis, interaction with domain experts or whoever, when you are trying to understand the project.	Acquiring knowledge from domain experts
There will always be those peculiarities in the business domain you are working that you need to understand, and for that you need the subject matter experts. When you go to them you can confirm your assumptions and then you understand the business.	Acquiring knowledge from domain experts
After you have had experience in different domains, you will know the pattern, so when you go into something new, do not worry, it could look really daunting, but you have to be like you have done this before, you can do it.	Experience of different domains
I think you get respect from the customers when they see you deliver a project, a product, they can see that you have put in the effort, that you made sure that everything is intuitive, and everything is making sense.	Meeting the client's requirement
I always go with a very structured interview process so that I'm not wasting the client's time. Then, work my way through all the information, make it clear and organised in a nice format and know how to present it.	Conducting interviews
In agile, you can learn the domain as you work with the customer and the team in different iterations...	Using agile methodology
We can understand the problem statement only if we can understand the domain terminologies. After a month, you are in a bit more solid state.	Understanding domain terminologies
Once you understand the domain, you can put up your user stories, present that information which you took ages to understand, the figures and trends.	Understanding domain terminologies
You have completed your requirement gathering, done all your research and analysis and when all the stakeholders come up with a solution, someone from the internal team can challenge you. As a business analyst, you need to have an open mind and get a hold of the situation.	Dealing with team resistance
You do know how to organise stuff in your domain, that's the business analyst skill, like understanding complex things,	Problem solving skills

understanding jumbled up puzzle sort of stuff, making sense out of complex scenarios or it could be just numbers.”	
When you enter into a new domain you should have this new lens of curiosity and ask all those questions that give a lot of valuable insights if you are trying to enhance some processes.	Being curious

Participant RX: Generation of codes from selected quotes

Participant quotes	Codes
The domain knowledge is so essential that wherever there is a lot of jargon related to a particular field as I found it really difficult to move from the taxation and financial services field to telecom field because they are totally different although the underlying process of working as a business analyst is the same.	Complexity in domain
If I have to be a very good business analyst or to be in scrum master role, I need to get that domain knowledge from proper sources and only then I could move ahead.	Acquiring knowledge from domain experts
When I spent more and more time on some other projects, I came to know there were other tax types in the department and they also had subject matter experts who were working as a kind of adviser to business analysts - not a technical analyst, but business side. Their main job was to just disburse that domain knowledge to whoever are looking for it.	Acquiring knowledge from domain experts
The place where domain knowledge is so essential is, where there is a lot of jargon.	Understanding domain terminologies
I had the domain knowledge but then the challenge I faced was to actually communicate that domain knowledge to the technical team, also, why are we doing it and what do we want to achieve after doing it.	Explaining the requirements
In New Zealand, during recruitment, they look just for domain knowledge and experience, and thought that my skills from India are not transferrable to New Zealand, my analysing skills, documenting, creating process maps, excel skills, and even some technical skills like backtracking from the code and reverse engineering code to produce the business rules.	Preferring domain knowledge

Participant RY: Generation of codes from selected quotes

Participant quotes	Codes
The challenge of domain knowledge is in complex domains, for example, network infrastructure is a complex domain.	Complexity in domain
Banking domain is far simpler than network domain in terms of technical understanding and expertise you need. Security domain, I would say is also a complex domain.	Complexity in domain
If you don't have domain knowledge, you might not capture something which is very crucial, for example in airlines domain, you should know the underlying facts of the domain and what are the next steps in the process.	Inadequate domain knowledge
It is all up to the business analyst to update himself with any new information that is coming, even maybe news feeds in the domain, depending on how important that is to the project or to the organisation.	Keeping up to date
The current organisation that I am working with supports learning. I have also enrolled to LinkedIn training, that is one big platform touching every domain.	Training via LinkedIn
First thing before requirements acquisition, I would say, understand the stakeholders, their behaviour, what is their role and way of working.	Understanding the client
I was taking some time to understand the domain, or the way the client's organisation works. I couldn't understand anything in one meeting, but I could always go back to stakeholders at later point of time to reflect back on what I understood and get more information out of them.	Getting information from the client
When I went for requirement gathering, I was not the expert, I had to ask some open questions like what this is, what are the requirements, and why those kinds of things.	Conducting interviews
In the initial requirement gathering, I hadn't any clue about what they were talking about because it was very technical, and networking, it is a big sea and there is a lot to learn in the initial stages. You need to understand what the customers are talking about. They will constantly use terms you should be aware of, and for that you need to upskill yourself.	Upskilling

If you do not have enough timeline when something new comes in, it can be difficult to learn new things for gathering requirement.	Challenging due to insufficient time
Microsoft Teams is really good collaborative tool where you can just add in the details and easy to share in a collaborative way. There are Jira, Microsoft suites, Visio type of tools are mainly used for communicating the requirements.	Using tools
Verbal communication is a challenge when you move to the southern hemisphere here in New Zealand, the accent is so different, that was a big challenge in terms of building rapport with the team members.	Understanding accents
I think generic business analyst skill is fine, but from there when you go in detail where you need detailed functional requirements, that is when the domain knowledge comes in play.	Acquiring functional requirements
If we already have domain knowledge, then things will move faster, but well, in the other case where you have just the business analyst skills, it will be moving, but that might not be in the same pace, might be of slower pace.	Transitioning faster
In a business analyst journey through a project, you may have to wear different hats, you may have to interact in other domains or subdomains, so having your basic business analyst skills ready is the biggest factor.	Using business analyst skills